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Research study on development and coordination of a policy agenda for urban management under Agenda 21

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Executive summary

The 74th Constitutional Amendment of 1992, brought in a major requirement toward the objective fulfillment of the Local Agenda 21 (or *Brown Agenda*). The need to tackle issues that are primarily local in nature (but which may have regional implications) was realized. It is necessary to take it one step further, by providing the municipalities with the operational tools along with organizational, legal and financial support and backing. A framework which puts these together in a form that is not politicized, but has the imperative to providing quality services to the society is necessary in context of rapid urbanization as is seen today.

Adequate provisioning of basic services such as clean water supply, sanitation, housing, clean forms of alternative energy and transport, and solid waste management, is seen as the main source of protection of the urban environment It has been the prime responsibility of the municipalities to provide these services, but for various reasons, this has been inadequate in quality and quantity. The reasons for this poor state of performance range from not-so-strong organizational linkages to lack of innovative systems to raise finances for servicing to inefficient use of the legal framework. Public consultation and appropriate management tools have not been part of the planning system as well.

From this study it is clear that for the municipalities to follow the objectives of decentralized environmental planning as suggested in the *Brown Agenda*, the Government of India would also have to decentralize environmental activity down to the municipalities and further to the ward committees and resident associations. Also, since the metropolises are more like states, they should be treated such, even with respect to environmental planning It is suggested that the LGs in these metropolises form an environmental unit, which involves itself with all planning decisions, preparation of environmental policies, monitoring and action programmes. For smaller urban areas governed by a *nagar panchayat* it is suggested that the District and Metropolitan Planning Committees (formed after the 74th Amendment) take the responsibility of their environmentally sound development A formalized methodology for ensuring that the various environmental representatives and units interact with the parastatal organizations (who are in charge of services development) needs to be drawn up These environmental representatives (units) need to be given the legal backing as well.

It is the popular feeling that the municipalities have little resources and financial powers to provide the service and infrastructure they are meant to. An analysis of the possibilities for the municipalities to raise revenue for this purpose and thereby protect (to a large extent) the urban environment, shows that some mere innovation in the present tax structure and the involvement of the private and community-based organizations, could prove beneficial to the municipalities. Improvement of tax collection systems; reassignment of certain taxes (like, profession, entertainment and advertisement tax) to the municipalities; transfer of the charge/penalties/fees from the pollution control boards to the municipalities; private participation in solid waste collection and disposal, and water supply; and allowing the municipalities to decide on the tariff rates (with a minimum ceiling specified by the State Finance Commissions); are some of the ways in ridding of the fiscal deficit faced by the municipalities today.

With the analysis of the existing legal framework that is relevant in the urban context, it is felt that there is sufficient legal backing for the municipalities to undertake the functions that are required of them in the *Brown Agenda*. Some minor amendments in the Municipal Acts, Town Planning and environmental legislation to include the functional, financial and organizational decentralization mentioned earlier, would help the process. Further, it is felt that there is a need for environmental jurisprudence and awareness within the municipalities and the community.

Finally, it is felt that without a vigorous and systematic pursuance toward environmental knowledge and information at the level of the municipalities, all efforts toward service provisioning will get negated to a large extent An environmental database, formulated on a need-based and purpose-driven method which contains all information desegregated to the level of a locality is the call of day. A standardized format developed by some professional agency needs to be used. The information contained in the database would be such that it provides all the necessary inputs required in developing specific urban environmental indicators and for carrying out environmental impact assessments. It is felt that the performance of the municipalities in undertaking their functions is monitored and evaluated, through a process of community participation. Also, the involvement of the people in the planning process has several incentives to the municipalities, which needs to be tapped. Their participation could be done through education of their legal rights and scope to litigate under various acts; by their direct interaction with the ward committees and resident associations.

CHAPTER 1

Introduction

Background

Urbanization in India has been rapid, unplanned, especially with respect to the environment. The high rate of migration into the cities (both rural-urban and urban-urban), increasing number of resident population, and the lack of long term planning by the civic authorities to cater to the basic needs of water, energy and housing has made the cities potent to live in.

At the basic level, these problems are localized and require attention through prioritized planning at the local level. In an urban set up, most of the environmental problems (air/water/noise pollution, land degradation, health, etc) relate to the level of services and infrastructure provided to the community. In turn, the provision of this services/infrastructure is primarily a function of the management of finances, implementation, operation & maintenance, which is the responsibility of the local bodies Thus, it is essential that the functions of the local bodies through various management (or institutional), legal and financial mechanisms be strengthened to help disburse their responsibilities toward the urban environment.

The realization by the global community that the urban local bodies could be instrumental in affecting environmental improvement, came to the fore several decades ago. This was confirmed through the recent Earth Summit at Rio de Janeiro in 1992. The *Agenda 21*, released after this Summit, has become the basic document which provides all nations with a recipe or direction by which they could work toward managing their environments sustainably Chapter 7 of the Agenda is devoted to promoting sustainable human settlement development, with the primary objective being that of improving the social, economic and environmental quality of human settlements. Broadly, the major programme areas include providing adequate shelter, basic civic amenities and a clean environment. Chapter 28 on *Local authorities' initiatives in support of the Agenda 21* is also an important section, where the main objectives include the development of a consultative process between the LG and the citizens/organizations and the enhancement of local programmes through policies, law's/ regulations and institutional rearrangement. It also aims that by the year 1996, most of the LGs would have undertaken a consultative process with the local population and achieved a consensus on the Local Agenda 21 (LA21) for the community. (These are dealt in more detail in Chapter 2 of this report.)

In support of the above, there are several things happening in the country. National, local and international workshops and debates have been organized to chalk out the necessary roles and responsibilities of the local bodies; case studies of best practices in the area of urban environmental improvement in the country have been documented for replication in other parts of the country; capacity-building priorities of the local bodies have been discussed; constitutional amendments have been made to include environmental functions of local bodies; amendments in the municipal acts have also been suggested to incorporate environmental protection; and, institutional changes have been made in several cities.

This report attempts to analyze and compile these various efforts made by the government, non-governmental organizations (NGOs), and others, and further suggest possible ways to improve their effectiveness. The Ministry of Urban Affairs and Employment (MUAE) has given this task to the Tata Energy Research Institute (TERI), New Delhi. Below is given the objectives of the study and the scope thereof.

Objectives of the study

The overall objective of the study is to propose national urban environmental policies and action plans that will result in environmental improvement of urban India. The specific objectives of the study are as follows:

- To suggest a legal, financial and institutional framework that will help in operationalizing the LA21 in the Indian context.
- To suggest environmental management options, such as environmental impact assessment of urban projects, and supportive methodologies (manuals), databases, etc., for making these options functional and implementable, that will aid in environmental improvement of urban areas.
- To develop a format for an urban environment database that will serve as a basis for environmental management programmes and planning.
- To suggest a consultative process between the LGs and the public/citizens that will ensure public participation in any urban planning process
- To develop national urban environmental policy and action programmes that will guide the governments in implementing more environmentally sound planning.

Introduction and scope of the study

Population, shelter/housing, water and sanitation, land use planning (including transportation planning, siting, etc.) are some of the important issues which determine environmental quality of an urban area. There are several determining factors to environmental quality, such as the spatial characteristics of urban areas, city size, spread, population density and land use, as well as non-spatial aspects like income distribution, and the institutional, financial and legal aspects of city administration. While the spatial characteristics are site-specific, the non-spatial aspects could be across all types of cities, with minor changes to account for any atypical spatial characteristic.

Considering that the planning and implementation of environmental management options are generally decided at the non-spatial level, this study aims to suggest legal, financial and institutional mechanisms (in addition/modifications to those that are already existing) that will help improve the urban environment Since it will be beyond the scope of the study to assess the differing spatial characteristics in relation to the planning options, only important aspects will be taken to support the discussions.

Scope

- The present and possible environmental status of urban India will be assessed briefly, to bring out the priority environmental issues across urban area.
- The institutional structure of the LG and other government organizations will be analyzed keeping the environmental focus on the priority environmental issues Inter linkages between the different organizations and the implementation of appropriate plans to mitigate the environmental impact
- Assess the present municipal finance system to suggest in the context of environmental services/improvement. Here a three-tier (municipal corporations, municipal councils and *nagar panchayats*) analysis would be attempted.
- A detailed assessment of the legal framework, i.e., the laws, regulations and constitutional provisions that have implications on the urban environment quality will be undertaken and possible inclusions to effectively improve the environment suggested.
- Suggest environmental management plans/options and formulate appropriate policies that would serve to fulfill the objectives of the Agenda 21.

Structure of the report

The report is structured as follows:

Chapter 2 *Urbanization, Local Agenda 21 and Initiatives* will look at urbanization trends in the country. It will also detail out the objectives of the ***Brown Agenda or the Local Agenda 21*** envisaged at the Rio Summit, 1992. Further, international and national efforts/initiatives towards fulfilling these objectives is given.

Chapter 3 on *Status of the urban environment* sets the context of analysis for this study by reporting on important aspects related to the urban environment in the country. It discusses priority services/infrastructure issues such as water supply, sanitation and sewerage/solid waste disposal, housing, land use planning, transportation, and energy, through snapshots of the status in urban India.

Chapter 4 *Analysis of institutional aspects* looks at the institutional structure of urban local bodies and the parastatal organizations, in order to analyze their performance (effectiveness) in providing the services/infrastructure mentioned above. Policy and functional recommendations are suggested.

Chapter 5 (*Analysis of financial aspects*) gives an overview of the financial mechanism of the local bodies. It assesses the financial position of local bodies in light of the services discussed Suggestions on financial policies, financial management and possible ways to raise revenue for infrastructure and services.

An *Analysis of legal aspects* related to the urban environment is discussed in Chapter 6. This section gives an overview of laws and regulations for the protection of the urban environment (constitutional provisions, municipal acts, land use regulations, environmental, etc.), and analyses its use in the urban context. The Chapter also provides a list of possible amendments in the existing regulations.

Urban environmental management options are discussed in Chapter 7 of this report. It looks at the various options available to the local bodies to help in conserving, planning and improving the urban environments. Among these are environmental databases, environmental indicators, urban area profiles, environmental impact assessments, environmental audits, public consultation and performance audits. This Chapter also examines the required support institutional, legal and financial aspects required to carry through these options.

CHAPTER 2

Urbanization, local Agenda 21 and initiatives

Urbanization trends

The politico-economic transition since Indian independence has influenced the urbanization process in several ways. Firstly, the pre-independence trend of migration from rural to urban areas gained further momentum. A large number of rural-urban migrants got absorbed in the informal sector, and several among them took shelter in the slums, with the result that today nearly one half of India's urban employment sector is informal and unorganized[1]. Secondly, the rural-urban disparities widened over time. This is reflected in the increasing differential between the rural and urban per capita net domestic product from 1:1.8 in 1950-51 to about 1:2.6 in 1970-71[2].

Urbanization has mainly occurred due to the structural transformation of the Indian economy from an agricultural one towards an industrial/service-based one. The shifts of labour and capital from predominantly rural to predominantly urban activities, and as a result we see a rapid growth in non-agricultural activities in the rural areas that are close to cities and metropolitan centres. Urbanization is not a transitory phenomenon, it reflects permanent structural changes that have occurred since independence.

Urbanization, in the sense of more and more people living in the urban areas, is by far the most important social change that has taken place in India in recent times. From a modest base of 25.8 million persons in 1901, the number of urban dwellers has risen to 217.6 million, signaling a phenomenal eight-fold increase in urban population over the period 1901-1991 During the past two decades (1971-1991), India's urban population has doubled, increasing from 109.1 million to 217.6 million **(Table 2.1)**.

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[1] Buch M N 1987 *Planning the Indian City*, New Delhi p 124.

[2] Rakesh M. 1995 Urbanization in India's future, *Population and Development Review* 4: 639.

Table 2.1. Urbanization trends in India

Census year	*Urban population (million)*	*Urban as % of total population*
1901	25.85	10.80
1971	109 11	19.91
1981	159.46	23.34
1991	217.61	26.13

Sources

1/ Census of India 1991, Provisional Population Tables: Rural-Urban Distribution, Paper 2 of 1991.

2/ Census of India 1991, Final Population Totals, Paper 2 of 1992.

According to the 1991 Census, 217 million out of a total population of 844 million now live in urban areas; the urban population is projected to increase to 300 million by the turn of the century. The decennial rate of growth of the urban population, however, has slackened from 46.1% in 1971-81 to 36.2% in 1981-91. This trend is the case in most states, except Himachal Pradesh and Kerala. There are 23 cities in India with a population of more than a million of which the mega-cities of Bombay, Calcutta, Delhi and Madras have populations exceeding five million. the number of million plus cities in India has increased dramatically from 12 in 1981 to 23 in 1991 and it is projected to increase to 40 by AD 2001.

The pressure of the increasing urban population (notwithstanding the decreasing growth rate) is increasing the gap between demand and supply of infrastructural services such as energy, housing, transport, communication, education and institutions, water supply and sewerage and recreation amenities. This has resulted in the deterioration of air and water quality, the proliferation of slums, illegal constructions and undesirable land use changes, all of which contribute to urban poverty.

Urbanization as a phenomenon is going to continue and increase rapidly in the coming years – a fact that should be accepted if urban planning needs to be effective. Keeping this basic perspective in mind, the international community is thinking of solutions to mitigate the environmental effects of urbanization, and to provide for a healthy living to the urban community. Several national and international programmes have been initiated all over the world to effect a change in the planning, policies and implementation of urban management. Some of these have been discussed later in this section. Most of these programmes have been as a fallout of the major global environmental conferences/decisions such as the Rio Summit in 1992 and the Sustainable Cities Project (discussed in more detail later).

What is Local Agenda 21?

At the Earth Summit in Rio de Janeiro during June 1992, a global plan of action namely the Agenda 21 was adopted with the aim to integrate environmental considerations into the very essence of the development process. Two among the 21 action areas identified in the Agenda, were the promotion of sustainable human settlement (Chapter 7) and *Local authorities' initiative in support of the Agenda 21* (Chapter 28). The former, focuses on the need for *Sustained urban development*, i.e., "to improve the social, economic and environmental quality of human settlements and the living and working environments of all people, in particular the urban and rural poor".

The latter stresses on local level initiatives to improve the urban environment. It calls for the interaction, participation and involvement of the community and local authorities in the planning and management of the urban ecosystem. Since most of the environmental problems are local and have more effective solutions at a local level, the authorities who construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes and establish local environmental policies and regulations, and assist in the implementing national and sub-national environmental policies, should be responsible to develop and promote the local environmental agenda.

The main objectives of this programme area, i.e., local authorities' initiatives in support of Agenda 21, are:

- By 1996, most of the local authorities in each country should have undertaken a consultative process with their populations and achieved a consensus on "a local Agenda 21" for their community;
- By 1994, representatives of associations of cities and other local authorities should have increased levels of cooperation and coordination with the goal of enhancing the exchange of information and experience among local authorities,
- By 1993, the international community should have initiated a consultative process aimed at increasing cooperation between local authorities;
- All local authorities in each country should be encouraged to implement and monitor programmes which aim at ensuring that women and youth are represented in decision-making, planning and implementation process.

International and national initiatives

For the past decade, realization that there is an urgent need to address and implement environmentally friendly planning systems at all administrative levels (central, state and especially the local), have initiated several programmes and policies. These programmes have created an impact by involving the community in the planning process and also initiated debate that is crucial for the review of the plans, fiscal allotments, legal aspects and administration. It has also brought in the important aspect of accountability.

International

Some of the international programmes, declarations and decisions that have been initiated are described below.

Sustainable Cities Programme (SCP)

The principal goal of the SCP was launched in 1990 by the United Nations Commission on Human Settlements (UNCHS).[3] Its main objective is to provide cities with improved environmental management and planning capacity which is self sustaining once the programme's support ends. The SCP is designed to assist municipal authorities to identify environmental issues at the city level, to establish priorities among these issues and to provide them with tools to address these issues. The programme will facilitate a better understanding of the costs and benefits involved and of the economic costs of environmental neglect. The aim is also to create greater awareness of good practice in planning and management of the urban environment as well as the potential impacts of city growth on the natural resource base of the surrounding region. The SCP will also help to build a developing country constituency for establishing and updating urban environmental data bases as the creation and updating of such information bases is essential for the management of the urban environment for policy formulation, programme implementation and for monitoring progress. Madras (Box 1) is one of three cities in Asia selected by UNCHS for a city level project of the SCP

International Council for Local Environmental Initiatives (ICLEI)

The ICLEI develops tools and management approaches for environmental protection, designs new approaches to difficult urban-centered environmental problems and helps the cities to develop local agenda's for action on the lines of the Agenda 21.

Urban CO_2 Reduction Project

This project started in 1990 as a research collaborative of 14 municipalities in the US, Canada and Europe working together with ICLEI (International Council for Local Environmental Initiatives) to create comprehensive municipal energy policies to reduce greenhouse gas emissions (GHGs) The main goals of the project are to encourage local authorities to make political commitments to reduce local energy use and greenhouse gas emissions. It also aims to facilitate an international network of LGs committed to greenhouse gas emissions reduction by developing and disseminating analytical methods, case studies and information for analyzing energy use at the urban level.

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[3] Urban Management Programme, The World Bank.1994. *Toward environmental strategies for cities: Policy considerations for urban environmental management in developing countries*. Edited by Carl Bartone, Janis Bernstein, Josef Leitmann and Jochen Eigen. **18**. UNDP/UNCHS/World Bank. p. 83.

Box 1

Madras SCP

The Madras Project had the immediate objective of "creating an organizational & systems framework and process for Madras Metropolitan Development Authority (MMDA), which will lead to the eventual formation of "Madras Incorporated", a sustainable city of the 21st Century, through continuous & effective involvement of all the players involved in & impinging on the city's development".

The major considerations of the project are to look at priority policy areas such as (a) a shift to direct developments to areas outside the municipal corporation limits, (b) modal shift in public transport in favour of rail system; © economic inputs integrated in urban planning, (d) avenues for increased participation of private sector in delivery & maintenance of services, (e) investments to prevent deterioration in living conditions, & (f) conservation areas

The strategies identified in fulfilling the major considerations (priority areas) were to (a) build capacities of individuals & institutions to identify, understand & tackle environmental issues that could be incorporated into planning. (b) emphasize the need for integrated approach & evolve the needed institutional arrangements; & © work through a bottom-up participatory process.

It proposes an organizational framework with *floating structures/task forces* that head into an urban development coordination group (UDCG) The UDCG will be responsible to synthesize plans & proposals put forth by the task forces, & make recommendations to the MMDA. It proposes that the task forces be permanent structures, with variable composition that is widely represented. The task force will be responsible for implementation, interphase & monitoring of the implementation *Issue groups* will be formed in each task force which will be given specific responsibilities, major among which will include public participation.

It is felt that the MADRAS PROJECT could be followed in other mega cities

Source: Dattatri G. 1992 *Role of cities for planning & management for sustainable development. A framework for effective public participation* UNCHS

So far three Municipal Leaders Summits on Climate Change have been held as part of this project Over the course of two years, 75 local authorities endorsed the Declaration in Climate Change and joined the campaign.

The importance of these declarations cannot be over-emphasized in the context of the Asia-Pacific region, since the urban areas in this region account for over one third of global GHG emissions. The Declaration calls for the industrializing countries to build inventories on local sources of GHGs and CO_2 sink losses while placing high priority on the use of renewable energy sources The LGs in the industrialized countries are asked to establish local action plans to reduce GHG emissions by 20% of 1990 levels by the year 2005 In Article 3 (Municipal Measures for Climate Protection) of the Declaration, it was recommended that specific actions be taken up by the municipal governments in the areas of urban infrastructure and buildings, transportation systems, energy supply, citizen lifestyles, waste management, and greening.

International Union of Local Authorities (IULA)

The IULA represents over fifty national associations of the LG and seeks to integrate environmental concerns into local planning and management, and increase the access of local and regional authorities to international organizations and meetings that deal with the environment. The IULA along with the UNEP supports the ICLEI.

The Metropolitan Environmental Improvement Program (MEIP)

This is a UNDP-funded effort executed by the World Bank, which have initiated programmes in five Asian cities in 1990 (Beijing, Bombay, Colombo, Jakarta and Metro Manila).[4] It aimed at developing (a) an environmental management strategy; (b) capacities to control pollution environmental protection agencies; © local environmental networks with local organizations to do studies, demonstration projects, workshops, etc.

There are several other organizations both regional and international that link urban governmental and non-governmental organizations in the area of environment, such as Habitat International Coalition, The Mega Cities Project, Citynet, Asia-Pacific 2000 and Medcities. There are also some professional groups which provide capacity-building and information on urban environmental management, such as International Solid Waste Managers Association, International City Managers Association, and International Association for Water Pollution Research and Control.

National

At the national level as well there are several programmes and organizations that have been working towards environmental planning of urban areas. Some of the schemes and plans[5] of the Central Government that aim towards this are:

Environmental Improvement of Urban Slums Scheme (EIUS)

The EIUS scheme has been operational at the state level since 1974. The scheme has benefitted about 10 million slum dwellers during the Seventh Plan and another 3.3 million during two annual plans, i.e., 1990/91 and 1991/92.

Urban Basic Services Scheme (UBSS)

A centrally sponsored scheme introduced in 1986, with the primary objective of enhancing the survival and development of women and children of urban low income families.

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[4] Ibid.

[5] GOI, Planning Commission. Eighth Five Year Plan, 1992-97. Chapter 13 *Urban Development*, p 344-359.

Integrated Development of Small and Medium Towns (IDSMT)

This scheme had the primary objective to provide complementary infrastructure support of critical significance. During the Seventh Plan period, 145 towns were covered in this scheme.

Nehru Rojgar Yojana (NRY)

Launched in 1989, its main objective was to provide support for self-employment and entrepreneurship. It is a scheme to develop micro-enterprises, wage employment and shelter upgradation There are various housing schemes supported by Housing & Urban Development Cooperative (HUDCO) and Life Insurance Corporation (LIC) as well.

Some of the other programmes of the government include the scheme for Housing and Shelter Upgradation, Scheme for Wage Employment and the formation of the National Capital Region Planning Board.

Building Materials and Technology Promotion Council (BMTPC)

The BMTPC provide a platform for technology transfer and application in the shelter sector and promoting commercial production of innovative materials, using fly-ash, red mud, phospho-gypsum and agricultural wastes and for appropriate design of houses both in urban and rural areas. Low cast sanitation and small towns water supply schemes for population less than 20,000. In order to provide facilities to the poor and the economically weaker sections of the society, centrally assisted programme for construction of individual and community latrines has been taken up along with the water supply schemes in small towns.

Apart from these several other programmes by non-governmental organizations (NGOs) and other organizations have been doing their bit in managing the urban areas such as the Sulabh International, Development Alternatives, National Institute of Urban Affairs, Human Settlements Management Institute and CIVIC Bangalore.

Eighth Plan thrust areas

The major relevant thrust areas defined in the Eighth Plan apart from the above programmes under urban development are.

- Macro strategy for urban development with explicit recognition of rural-urban linkages, accounting for locational policies of industries, accelerated pace of rural development, and employment generation.
- Emphasis on the development of small and medium towns.
- Better integration of urban development, housing and employment generation.
- Urban poverty alleviation and provision of basic services through people's participation.

- Resource mobilization through metropolitan governments, including the rationalization of existing tax and non-tax resources, and the need for the devolution of funds from the state to the LGs.
- Removal of legal bottlenecks such as Urban Land Ceiling & Regulation, Transfer of Property, Land Acquisition and Rent Control Acts.
- Decentralized framework of urban government with the necessary participation of local communities.

Analysis of national initiatives

The Legal, Regulatory and Institutional Framework

The regulatory and institutional decision-making framework for environmental protection in India is embodied in eight major acts of the Indian Parliament. These are; the Water (Prevention and Control of Pollution) Act of 1974 which established the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs), the Air (Prevention and Control of Pollution) Act of 1977 which added the monitoring of air emissions to the responsibilities of the various Boards; the Environment (Protection) Act of 1986; the Forest (Conservation) Act of 1980, amended in 1988; the Motor Vehicle Act of 1938, amended in 1988; the Public Liability Insurance Act of 1991; and Notifications on the Coastal Regulation Zone, 1991; and Environmental Impact Assessment of Development Projects, in 1994.

Most of the above Acts and Notifications are aimed at strengthening the command-and-control regime. New initiatives, especially in the form of a mix of regulations and legislation, fiscal incentives for technology acquisition, voluntary agreements, educational programs and information campaigns are required Although the Government of India (GOI) has introduced some of these measures, more is required because the regulatory structure of a central authority i.e. the Ministry of Environment and Forests (and other Ministries) and the Central Pollution Control Board linked to state level implementation agencies; the Departments of Environment, Forests, and the State Pollution Control Boards (and other agencies), have proved to be largely unsuccessful in effectively managing the protection of the environment.

Environmental management is a continuous process that consists of three interconnected steps: (a) the collection and analysis of relevant data; learning from worldwide "best practices" and incorporating these in the planning, formulation, and implementation of policy including the setting of standards; (b) program implementation, monitoring results and active compliance enforcement; and © periodic verification through independent auditing. An assessment of India's environmental management system suggests that weaknesses are evident at each of these three main steps and at every administrative level i.e. center, state and district (municipality and panchayat). More needs to be done in the area of industrial pollution, particularly air emissions, coastal zone management, urban land use including the citing of industries, and mitigating environmental degradation in the mining sector.

In brief, environmental management capacity has to be enhanced. This will require more effective professional and technical integration of environmental concerns into policy planning, formulation and implementation; changes to, and or enhancing institutional structures to strengthen monitoring, compliance and enforcement of environmental laws and standards, decentralizing center level command-and-control of environmental initiatives to the state, district and community both for local ownership and local relevance, introducing more non-traditional approaches to environmental management including an increased role for community-based non-governmental organizations; and a recognition that training and upgrading of staff and officials who operate the environmental management institutions and agencies is a sound investment.

GOI's Sectoral Strategy

In December 1993, the GOI through the MOEF issued the Environment Action Program - India (EAP). This plan was developed after consultation with other Ministries, States and Non-Governmental Organizations (NGOs) The EAP identified seven environmental priorities for GOI as follows. (a) conservation and sustainable utilization of biodiversity in selected ecosystems including forests, mangroves, wetland, coral reefs, mountain ecosystems; (b) afforestation, wastelands development and conservation of soil and moisture and ensuring that water sources are not polluted, © control of industrial and related pollution with an accent on the reduction and management of wastes, particularly hazardous wastes; (d) improving access to clean technologies; (e) tackling urban environmental issues, (f) an alternative energy plan, and (g) strengthening scientific understanding of environmental issues, as well as strengthening structures for training at different levels, orientation and creating environmental awareness.

Legislation explicitly directed at protecting the environment was put on the statute books for the first time with the Water (Prevention and Control of Pollution) Act of 1974. This was followed by the 42nd Amendment of the Constitution in 1977, which introduced two new entries dealing with protection of the environment. Entry 48-A states that the state will protect and improve the environment and safeguard forests and wild life. Entry 51-A(g) states that it is also the duty of a citizen to protect and improve the natural environment including wild life. The Forest Conservation Act followed in 1980, the Air (Prevention and Control of Pollution) Act in 1981 and finally the comprehensive Environment Protection Act in 1986.

The Water Act established the Central and State Pollution Control Boards for its own implementation. The same Boards were later empowered to enforce the Air Act These are the two main legal instruments being employed by the Boards for protecting water and air quality The Environment Protection Act of 1986 (EPA) now also authorizes the Central Government to intervene directly in order to protect the environment and also allows public interest litigation for the same purpose. The nature of penalties allowed under the EPA are similar to those authorized under the Water and Air Acts discussed below.

The Central Pollution Control Board has laid down ambient standards for both water and air as it is required to do under these Acts. However, the enforcement aspect of these Acts is confined almost entirely to individual polluters and the source specific standards that apply to them As a consequence there is little that can be done under these Acts to improve or even preserve ambient air or water quality beyond enforcing the standards which apply to individual polluters Of course the Government can always undertake cleaning operations own its own as in the Ganga Action Plan.

Enforcement of the Water and Air Acts

It was pointed out earlier that while in principle the Water Act and Air Act empower the Boards to lay down and maintain ambient water and air quality standards, the actual provisions for enforcement such as penalties, imprisonment etc. are largely confined to source specific standards for individual polluters. Some of the principal features of these Acts also make it clear that the enforcement provisions can be quite severe, going up to seven years imprisonment in some cases.

The data on legal proceedings under the two Acts also suggests that these enforcement provisions are not just confined to the statute books. The number of cases launched under the two Acts has steadily risen in recent years from under 2,000 cases in 1987 to over 5,500 cases in 1992 About eighty per cent of these cases are launched under the Water Act. It is also reported that during the current year nearly 5,000 cases had already been launched by end June, 1993. Unfortunately, the number of cases pending has also been rising. However, relative to the number of cases launched each year their proportion declined from around 73 per cent in 1987 to about 62 per cent in 1992.

An analysis of court decisions in cases filed under the Water Act shows that in 1992 court decisions were in favour of the Boards in about 62 per cent of these cases as against 70 to 80 per cent of such cases in the late eighties.

The break up of conviction orders, available only for the last year, shows that there were as many as 109 imprisonment orders, 72 orders for fines and 173 restrain orders.

In the case of decisions under the Air Act, about 65 per cent of these cases were decided in favour of the Boards in 1992, down from 80 to 90 per cent favourable decisions in the late eighties. This would suggest some deterioration in the efficiency of enforcement along side the increase in enforcement effort. However, the punishment pattern seems to be more severe under the Air Act as compared to the Water Act cases. Out of a total of 293 convictions in 1992, 153 decisions were imprisonment orders, 138 decisions were fine orders and only 2 were restraint orders.

In conclusion (a) despite a strong legal framework and various Ministries at the center, Departments and Boards at the state level and local agencies involved in environmental management, implementation remains weak. Institutional capacity building to strengthen monitoring, enforcement, and compliance with existing laws can have a high payoff, and (b) recognizing that the government alone cannot be responsible for environmental management, stronger efforts have to be made to involve the large non-governmental organization community in programs ranging from biodiversity conservation to alternative energy programs This cooperation will require transparent polices and practices such as early involvement in the environmental impact assessment process, access to information, and action to increase involvement through public participatory processes.

Largely, the above mentioned national initiatives have resulted in little difference, as can be seen from the grossly inadequate services and infrastructure in most of the urban areas Why is this the case? Why have the programmes and initiative failed to be as effective as they were proposed to be? What strategy is necessary to make these effective?

Primarily, the national/state plans and programmes were drawn up a long time back, when the urban environmental situation was quite different from what it is today. Secondly, most of these programmes were planned at a large scale and in a top-down manner, not keeping in mind regional and local differences in resource availability, cultural and economic aspects. Thirdly, more importance was given on the end product envisaged in the programme, less on the methodology for reaching this, and even more less on its quality.

The problem of service delivery is obvious with the large variations (as mentioned above) that exists in urban areas Many of the basic services (water supply, sanitation, solid waste disposal, etc) are dealt with by the local bodies/governments and therefore it is important to examine the organizational aspects that will make service delivery more effective (dealt with in detail in Chapter 4) Although there are several issues related to the implementation of these programmes, it is not say that the programmes have failed completely in their objectives Replicability with more strategic and local planning of them will be crucial in future.

There are very positive and important thrust areas identified in the Eighth Five Year Plan as listed above, especially with reference to resource mobilization through metropolitan governments and decentralized framework of urban government with necessary participation of local communities Also, the recent 74th Constitutional Amendment has provided some leverage for this decentralized framework and planning to take place What is essential to carry this through, is strategic planning at the local level with back up organizational, legal and financial systems in place. These have been detailed in the next few chapters

CHAPTER 3

Status of the urban environment

Overall status

Urbanization is a natural consequence of economic changes in a country. The economic advantages of urbanization are often overshadowed by the evident deterioration in the physical environment and quality of life in urban areas caused by the widening gap between demand and supply of essential services and infrastructure.[1] This results from increasing population pressure on urban centres.

Cities in India–growing at an annual average rate of 3.4% to 3.8%– are today faced with multiple and complex environmental problems About 20% of the urban population in India (25.72% in 1991) lives in slums, and it ranges from 18% in Bangalore to 42% in Calcutta. The immediate and most critical environmental problems in urban areas are those that are linked with the absence of essential services and infrastructure such as safe water supply, sanitation and drainage, solid waste treatment and disposal facilities, transportation, housing and energy. Also these problems are so many and specific to an urban area, that setting of priorities is crucial; also, coping with infrastructure challenges requires in-depth and a long term strategic planning of demand (or pressure), investment and quality. In order to prioritize the environmental issues that require immediate attention, the present status of the urban environment needs to be examined.

This chapter looks at the environmental status of urban areas in the context of infrastructure, population and public administration. An overview of the essential aspects of the urban environment such as air quality, water supply and quality, noise, and land degradation, and the status of services and infrastructure such as waster supply and sanitation, solid waste disposal, transportation, energy, etc., have been discussed here

Air quality

It is a known fact that the general air quality in most major cities is deteriorating While some mega cities represent extreme cases, there are no escaping air pollution or its health consequences in most of the world's cities. According to an assessment (1988), more than 600 million people live in urban areas where sulphur dioxide (SO_2) levels exceed the standards of the World Health Organization (WHO), and more than 1.25 billion live in cities with unacceptable levels of suspended particulate matter (SPM).[2] In Bombay, both SPM and the oxides of nitrogen (NOx) have exceeded the levels specified by the World Health Organization (WHO). Emissions of NOx and carbon monoxide (CO) have increased with increasing transportation. In Delhi, levels of SPM remain very high, and although the concentration of NOx is within limits, it has doubled between 1981-87. In spite of legal provisions as well as institutional backup, the ambient air pollution level in most of the cities has been increasing (Table 3.1). The standards set are stringent (Annexure 1), but the penalty for exceeding these levels is marginal and not enforced. Even small towns are faced with the problems of pollution:

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[1] Planning Commission, GOI. 1992-97. *Eighth Five Year Plan*, p. 344.

Table 3.1. Cities/towns where either the annual mean concentration exceeded the standards or 24-hourly concentrations violated the standards for 5% times or more, (mg/m^3), 1992

SPM	NOx	SO_2
Jharia, Dhanbad, Patna, BIH	Gajroula, UP	Vishakapatnam, AP
Ahmedabad, Baroda, Surat, GUJ	Calcutta, Haldia, Howrah, WB	Gajroula, Agra, UP
Indore, Satna, Bhilai, Bhopal, Jabalpur, Korba, Nagada, MP	Ahmedabad, Surat, GUJ	Calcutta, Howrah, WB
Guwahati, ASSAM	Guwahati, ASSAM	Ahmedabad, GUJ
Rourkela, Angul, ORI	Jabalpur, MP	
Ludhiana, PUNJ	Jalandar, PUNJ	
Parwanoo, Shimla, HP	Alwar, RAJ	
Gajroula, Dehra Dun, Kanpur, Agra, UP	Shimla, HP	
Delhi		
Hyderabad, Vishakapatnam, AP		
Faridabad, HARY		
Cochin, Kottayam, Kozhikode, Trivandrum, KERA		
Nagpur, MAHA		
Alwar, RAJA		
Howrah, WB		

Source
National Ambient Air Quality Statistics of India - 1992, CPCB. NAAQM/6/1994-95.

Countries like China, Brazil, Mexico, Iran, South Korea, France, Italy and Yugoslavia have cities with higher concentrations of SO_2. But in the context of SPM, Indian cities are rated to be the worst, with Chinese cities having the second highest concentrations. Of course, one must keep in mind that background natural dust in semi-arid areas is high. Monitoring of fine particulate matter will resolve this question The SPM values may also indicate increasing use of diesel for transport.

World Resources Institute 1994-95 Atmosphere and Climate, p. 198 in *World Resources: A Guide to the Global Environment -People and the Environment*, A report by World Resources Institute in collaboration with the UNEP & UNDP Washington, D.C., USA, Oxford University Press, p. 400.

In addition to ambient air pollution, indoor air pollution caused by extensive use of biomass sources as basic fuel, is one of the most widespread environmental problems in the Indian cities is indoor air pollution. An estimated 45% of urban households depend on traditional energy sources such as firewood, animal dung and vegetable wastes, etc., which are important sources of indoor pollution. The severity of the problem is felt more on account of the very high degree of congestion in households using such fuels.

Water quality

Urbanization causes increasing exploitation of water. A survey by the CPCB[3] in respect of 241 Class II towns in 17 states of India indicates that on an average, 90% of the water supplied is polluted Only 1.6% of the polluted wastewater gets treated According to the study of water pollution in Ganga Basin (which forms the focus of the major Ganga Action Plan of India) it is estimated that three-fourths by volume of the wastewater generated is from municipal sources, 88% of the municipal sewage being from Class I cities.

Coastal and estuarine water resources in India depict the following quality characteristics - an exceptionally high concentration of lead and cadmium, 820 μg/l and 336 μg/l respectively, were observed in Thane-Creak of Bombay coast, while the mercury concentration is 778 μg/l. The high levels of pollution particularly in Thane-Creak and Mahim-Creak are caused by the discharge of huge quantities domestic and industrial wastes. A major portion of the waste is released in Ulhas river and Bassein-Creek also. Sediment along the creeks and near-the-shore stations showed significant concentration of lead.

Noise

The increasing noise level in cities is a rather recent phenomenon. The various sources of noise pollution in cities include automobiles, railways, aircraft machines and sirens in industrial areas, public address systems, social and religious activities, etc. Noise levels monitored in various areas of Delhi by the Central Pollution Control Board (CPCB) show that the average noise levels in residential, commercial and industrial areas exceed the prescribed standards during day and night times. Even the silence zones have high noise levels. Noise levels at the different road intersections in Delhi have registered levels of 70-80 dB(A). In Bombay the noise level along all the major roads is high.

CPCB 1988 *Status of water supply and wastewater collection, treatment and disposal in Class I cities.*

The incidence of noise pollution has been on the rise especially in big cities of India such as Delhi. Ambient noise levels in 25 different locations comprising sensitive, residential, commercial, and traffic areas of Delhi during May-June, 1989 were far in excess of the permissible standards laid down for noise levels. The noise levels for industrial units are found well below the standards of 75 dB.

Land degradation

Agricultural lands as well as forest lands have been encroached upon by the expansion of urban areas. Especially in big metropolises and growing towns, the value of land for development is seen to be more crucial than the long term beneficial costs of the agricultural land or forests. In less than a decade, the loss of forested area varied from a modest 15% around Coimbatore to a staggering 60% decline around Delhi. Whether the losses of these areas have been due to land requirement for expansion, or due to degradation (like for example commercial logging, fuelwood requirements, etc.), the fact remains that there is loss. A major reason for this happening is the lack of futuristic planning of the cities accounting for growth patterns, alternative growth centres, etc.

Table 3.2. Changes in closed forest cover around major cities in India

	Forest cover (hectares)		
City	*1972-75*	*1980-82*	*Change (%)*
Bangalore	3853	2762	-28
Bombay	5649	3672	-35
Calcutta	55	41	-25
Coimbatore	5525	4700	-15
Delhi	254	101	-60
Hyderabad	40	26	-35
Jaipur	1534	786	-49
Madras	918	568	-38
Nagpur	3116	2051	-34

Source

B. Bowonder, et.al. 1985. *Deforestation and Fuelwood Use in Urban Centers*, India, Centre for Energy, Environment, and Technology, and National Remote Sensing Agency.

Data for the period 1971-81, indicates that area under urban lands increased by more than 20%. In Punjab, the increase was of the order of 73.3%, and in Haryana, of nearly 70%.

Priority issues

One does not need to conduct statistical analysis to list out the environmental issues which are basic to all those living in urban areas. Most of the environmental problems are visible, and do not have to be quantitatively expressed to understand their magnitude. Although, quantitative assessments are more easily believed, sometimes just a qualitative analysis reveals a lot. The tangible effects (such as air/water/noise pollution, solid wastes, land degradation, etc.) result in intangible ones such as changes in standard of living, health (income, employment, etc.). A good percentage of these problems could be effectively tackled through proper planning of five key issues.

- Water, sanitation, sewerage and solid wastes
- Land use planning
- Housing
- Energy
- Transportation

Although in several ways it is very difficult to draw the line, say, between housing and land use planning and transportation and energy, it has been done here to get clarity into the issues and define action plans and policies appropriately The deterioration in the quality of the urban environment in the metropolitan cities is partly a consequence of the inadequate urban services such as wastewater collection and treatment, sanitation, solid waste collection and disposal, energy, and transportation, and the remaining of inadequate financial resources, legal enforcement and weaknesses in the institutional mechanisms/structure.

Before we examine the institutional, financial and legal aspects of these issues, a general overview of the key issues has been given below.

Water and sanitation

Water, the primary element of the environment, is most essential for a good quality of life. Although, in its largest context, its availability is far more than the demand, but quality water is steadily getting degraded and scarce, due to industrial pollution, raw sewage disposal and pollutant leaching through the soils into the ground water.

Water supply

Water supply in India is inadequate and inequitably distributed in both the urban and rural areas. According to an estimate[4] only 30-40% of the urban poor have access to safe water supply, only 8% of the cities have underground sewerage system, and 31% had no sanitation facilities[5]. In 1981, nearly 33 million people (22%) of the urban population were without safe water supply in the country. The quantity supplied even to those covered by the system was not very satisfactory. The average per capita water supply in Class I cities in the country is 141 liters per capita per day (lpcd), while the average for Class II towns is 78 lpcd. Wide variations are discernible in the supply between cities and even within the cities. Due to shortages of water, the tube wells are put deeper and more regularly, with the rate of withdrawal increasing. Excessive withdrawal of ground water to meet the growing demand creates its own set of problems. For example, in Ahmedabad, excessive withdrawal has pushed down the water table in the central zone from an average of 100 ft in 1965 to a level of 300 ft in 1990. The demand for water has been rising in urban areas not only due to a growth in population but also due to a growth in economic activities.

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[4] Shivaramakrishnan, K C 1993 *Managing the urban environment in India. towards an agenda for* action Vol. 1: Overview Workshop on role of cities for management of urban environment in India Bangalore August 26-28, 1993.

Table 3.3. Accessibility to water supply and sanitation

Facility	*Percentage covered (%)*		
	1985	*1990*	*1995*
Drinking water supply			
Rural	56.3	73.9	82.8
Urban	72.9	83.8	84.9
Sanitation			
Rural	0.7	2.4	3.6
Urban	28.4	45.9	47.9

Source

GOI. 1995-96. *Economic Survey*. p. 181

From Table 3 3 it can be seen that the percentage of coverage has steadily increased, but coverage is a deceptive indicator of the services provided. It is so, because the meaning of coverage does not account for the number of days of supply, quality of supply, the quantum of supply, etc.

Water quality

Inadequate water and poor water quality create several health problems. Water borne diseases due to water logging in the monsoon season, effluents discharged in the rivers and lakes have led to serious contamination of water leading to a variety of water borne diseases. Water and sanitation related illnesses' account for almost 60% of all urban deaths.

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[5] Alok Mukhopadhyay. 1992. *Health systems and services*. State of India's Health. Voluntary Health Association of India. pp 66-67

Water treatment

The situation of waste water treatment is not satisfactory even in metropolitan cities. The 12 metropolitan cities had an estimated waste water generation of 6462 mld, out of which only 30% (or 1930 mld) gets treated. Proper collection and disposal of liquid and solid waste have also been fairly neglected.

A survey conducted by the Central Pollution Control Board (CPCB) in 1988[6], showed that of the total volume of waste water generated by 212 Class I cities was 12,145 million liters a day (mld), of which only 22% was treated Of the 241 Class II towns which generated 1298 mld of waste water, only 2% was treated. Out of a total population of about 10295 million residing in all these cities, only 3,866 million (37.6%) were connected to a sewerage system

Solid waste disposal

A study by the Operations Research Group, Baroda, (1989), reveals that while a total of 14786 tonnes/day of solid waste is generated in 24 cities, only 11548 tonnes/day is collected, i e., about 77%. Very few cities like Bombay, Madras, Ahmedabad and Bhopal have a collection efficiency of more than 90%. Some cities like Madurai, Cochin, Tiruchi, Calicut and Salem have a poor collection efficiency of below 50%.

Besides the municipal solid waste, which is organic and/or inert in composition, the hospital waste, which contains germs of contagious diseases, is not disposed off properly, very few hospitals have incinerators, which either remain out of order or are not used As a result, the hospital wastes are thrown outside the hospitals and finally this waste finds its way into the municipal solid waste system and gets disposed with the other wastes causing serious environmental problems. The awareness for disposal of hazardous industrial waste is yet to pick up amongst industrialists and civic authorities in the country Even though under the Hazardous Waste (Management and Handling) Rules, 1989, it is mandatory for the industries to dispose off their waste properly, in reality, this waste also gets mixed with the municipal waste

Health implications

The health implications of inadequate quantity and quality of water supply as well as sanitation facilities are well known and documented. But in order to state the problem in this context seems appropriate. Unplanned development in the urban areas has lead to conditions that are conducive to the proliferation of insect vectors of disease Large water bodies left unattended after construction activity has led to the problem of malaria, urban filariasis and dengue. In Tamil Nadu for example, 50% of malaria is contributed by Madras city alone, largely as a result of uncovered overhead tanks and wells. Tuberculosis, classically a disease of overcrowding and poor ventilation, is found in urban settlements in slum areas - this disease is on the increase. On an average, 40% of urban families live in single rooms - 70% in Calcutta and 82% in Bombay.[7]

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[6] CPCB 1988 *Status of water supply and wastewater collection, treatment and disposal in Class I cities.*

It is clear from the above that the local governments need to review their system of providing of services to the community. Most of the big cities, despite the disproportionately high expenditure on services (in comparison to other expenditure), there are a marked shortage of clean drinking water and environmental hygiene. Inadequate water supply, sanitation and solid waste disposal facilities lead to health problems which have a high environmental cost to the society.

Land use planning

Inadequate and inequitable supply of serviced land particularly in urban areas has been the most significant bottleneck for the promotion of housing activities and urban development at large The aspect of supply and management of land needs to be viewed both from the larger dimension of regional development and city/town level growth. It would mean that all development in city/region should take place within the framework of the comprehensive development plan with spatial linkages and with planned provision of basic services.

Land use planning has been given very little importance in the Five Year Plans, which has usually focussed more on economic planning rather than spatial planning According to the National Land Use Policy Outline, (1986), of the Government of India (GOI), the per capita availability of land would deteriorate from 0.89 ha per person to 0 33 ha per person while the per capita availability of land for the animal population of the country would decline from 0.51 ha per person to 0 24 ha per person. This includes forest lands as well. The link between these tendencies of a declining ratio of natural resource to human and poverty, must be considered from the point of view of the distribution of land and the differential access to natural resources enjoyed by the various segments of India's population.

Only a small percentage of India's population own land whether it is agricultural, non-agricultural and/or urban land This fact is coupled with the high rate of unemployment and population growth in both the rural and urban areas. Also the increasing land prices have made it impossible for the incoming population from rural and other smaller towns (in search of alternate employment) to find land/housing, thereby the proliferation of slums

Growing cities and formation of new towns/cities, increases the pressure on natural resources such as water, biodiversity, etc., to irreversible extent. Also, additional pressure is being put due to land requirements for housing and infrastructure for an increasing

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[7] VHAI State of India's Health 1992. Edited by Alok Mukhopadhyay p. 414

population. To contain these impacts to the minimum and protect the environment for the future, strategic planning with foresight of the spatial and non-spatial aspects of urbanization is crucial and immediate.

Housing

About one-fifth of India's population lives in slums; one-half of the households reside in dwellings measuring less than 20 sq. mt each. Almost 42% of the urban households live in one room accommodation while nearly 28% live in two room accommodations. Such overcrowding causes serious health and environmental hazards. Those who are unable to have access to even these overcrowded dwelling units end up living on pavements or other open spaces According to the Census of India 1981, the houseless population in Calcutta numbered 37,642 or 7,084 households. In Bombay, the number of households living on pavements was as high as 22,600 in the same year. Rapid population growth, migration and high cost of land and housing infrastructure have resulted in the proliferation of slums and squatter settlements.

Table 3.4. Households, usable housing stock and housing shortages/gaps in 1991& 2001

Particulars	*1991*			*2001*		
	Rural	*Urban*	*Total*	*Rural*	*Urban*	*Total*
Households	113.5	47.1	160.6	137.0	72.2	209.2
Usable housing stock	92.9	36.7	129 6	111.5	56.7	168.2
Housing shortage	20.6 (21 2%)	10.4 (9 6%)	31 0 (30.8%)	25.5 (26.5%)	15.5 (14.3%)	41.0 (40.8%)

Source

GOI 1992-97. Planning Commission. *Eighth Five Year Plan.* Vol. II *Sectoral Programmes of Development* p 361

As indicated in Table 3 4, in future the housing shortage is going to increase further. In urban areas it seen that the shortage is going to increase by 4.7%. In the Seventh Plan (1985-90) the total outlay for housing was Rs. 25,600 lakhs and the actual expenditure were Rs. 17,538 lakhs.

The emergence of slums is essentially the product of three forces: demographic dynamism of a city, its incapacity to meet the rising demand for housing, and existing urban land policies which prohibit access of the poor to the urban land market.

The estimates of India's urban population living in slums vary. According to the information provided by the National Buildings Organization (NBO), New Delhi, 18.75% of India's urban population was living in slums in 1981. The Seventh Plan document also adheres to this estimate[8]. The actual number involved was about 30 million out of a total urban population of nearly 160 million (including Assam) The share of slum population in the total has a positive relationship with the size of towns/cities

The magnitude of the housing requirement during 1991-2001 is estimated to be 79 million dwelling units to meet fully the backlog and requirements of additions to population.

The inability of urban households to secure access to the housing market is equally reflected in the percentage of households who live in temporary and semi-temporary structures In Andhra Pradesh, almost 39% of urban households live in temporary, semi-temporary structures; in Bihar, Karnataka, Madhya Pradesh, Orissa, and Tamil Nadu, over one-third of urban households live in such structures, exposing themselves to various kinds of risks and hazards.

Health implications

The environmental effects of living in slums are manifold. Diseases like tuberculosis, meningitis and influenza are transmitted easily in crowded, cramped conditions coupled by the fact that resistance is low. Mumps, measles, and gastro-enteric diseases are also prevalent posing a grave risk to infants, children and the aged. The infant mortality rate in the *bustees* of Delhi was 221 per 1000 live births, which is nearly four times the average rate for India's urban population of 59. Household accidents from fires, stoves and household chemicals are often higher in crowded housing.

The use of inferior fuels like wood, waste material, coal and cowdung in small dwellings with inadequate ventilation results in enhanced indoor levels of carbon monoxide, nitrogen dioxide, suspended particulate and hydrocarbons. A study of low-income areas in Bombay showed that there was significantly higher morbidity among those with poor nutrition, particularly in the presence of high levels of pollution.

Planning of housing infrastructure and the quality of this housing infrastructure needs to be linked with strategic land use planning and rural development, if the problem needs to be effectively tackled. Alternative forms/means of employment need to be generated, and strict enforcement of housing (size per person) norms need to be followed.

Energy

It is a known fact that urban areas are large energy consumers. Energy consuming sectors in the urban areas are commercial, domestic, transport and industry A large part of the energy consumed in the latter two sectors is determined by supply (many times external to the urban area) and other economic factors, which will not be looked at here. Also, these sectors are not under the management of LGs where as for the commercial and domestic sectors there are areas where the LGs can play an instrumental role.

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[8] Government of India, *Seventh Five Year Plan*, Vol II, Planning Commission, New Delhi, p 671.

Growing urban populations have growing energy demands. The total commercial energy consumption by households, increased at a rate of 8.1% per annum over a period of 1981-91. The liquefied petroleum gas (LPG) consumption has been growing at an annual rate of 18% for the period 1984/85-1989/90; electricity consumption grew by 13% during the same period; and kerosene by 7% The demand for soft coke went down by about 8% annually.[9] Energy consumption by end use show that, cooking (57%) accounted for the highest, followed by space cooling (18%), lighting (9%), and others (8%), water heating (7%) and the rest (1%) went for space heating.[10] The commercial sector has responded to the inadequate supplies of commercial energy, by using diesel generators. This increasing use of high speed diesel oil (HSDO), will have implications on increasing imports (more than 30% of total diesel is being imported today into the country)[11], and on the local air quality.

The average per capita energy consumption in India is amongst the lowest in the world (commercial per capita energy consumption was 228 kilograms of oil equivalent (kgoe) in 1993 as compared to 7,815 kgoe in the USA and 3,720 kgoe in United Kingdom)[12]; although there, is a wide range across different income groups. Also, energy is received and used highly inefficiently due to several reasons (a) energy generation technology, (b) high transmission and transportation losses; © wastage, and (d) inefficient end use technology (appliance). There is also very little effort to use alternative and renewable energy sources in the urban areas. With the generation of large quantities of municipal solid wastes and sewage in urban areas, there is sufficient scope to utilize this for the generation of energy, thereby being advantageous three-times over - disposal, manure generation, energy production.

Inaccessibility of cleaner fuels, such as LPG and electricity to the urban poor, has forced them to use traditional fuels (firewood, dung, etc.), in spite of the several respiratory health problems related to the use of these fuels.

Energy demand and supply side management is necessary in urban areas, which consume a large quantum of energy resources. The choice of alternate (clean) fuels and the efficiency improvements for the domestic and commercial sectors (at least) could be part responsibility of the LGs. There needs to be a concerted effort on the part of the LGs to tap alternative sources, educate the public about the advantages of utilization of renewable forms of energy, and develop R&D in this area.

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[9] TERI 1995 *Trends in energy consumption* Chapter 3 Environmental considerations and options in managing India's long-term energy strategy (Eco miles) Study supported by UNEP. p 49.

[10] Ibid. p.50.

[11] GOI Ministry of Petroleum & Natural Gas 1994/95 *Indian Petroleum & Natural Gas Statistics*. p. 17.

[12] Ibid. 1993-94. p 174.

Transportation

During the period 1981-87, the production of cars in the country increased at an annual average growth rate of 23%, of scooters by 20.8%, and of buses and trucks by 3.3%. In megacities the number of vehicular trips is expected to double by 2000 A D. The number of vehicles per 1000 populations has increased from 0.85 in 1951 to 25.31 in 1991, and is expected to cross 40 by the year 2000 A D. The bulk of the vehicular population is found in the urban areas, with 35% concentrating in the 23 metropolitan cities. Of the 25 million vehicles during 1993, about 80% are personal modes of transport, with the share of 2-wheelers and cars at about 68% and 12% respectively.[13] This process reflects a shift in the distribution of income, with larger middle-income group households having potential for owning their personal means of transport.

Compared to the problems of water and sanitation, the issue of air pollution in Indian cities is rather new. The transport sector is the major source of air pollution in the urban areas. Major polluting industries and automobiles plying on roads emit many tonnes of pollutants every day in the air, putting an average urban citizen to greater health risk. The incidence of respiratory diseases in cities has increased considerably over the years. The thermal power plants in cities emit huge quantities of pollutants into the air. The three thermal power plants in Delhi viz. Indraprastha, Rajghat and Badarpur, emit 9.9 tonnes of pollutants every hour!

The CPCB has been monitoring air quality since 1984. At present, it monitors air quality at 260 stations spread over more than 75 cities/towns under the National Ambient Air Quality Monitoring (NAAQM) network. The pollutants emitted from vehicles, prove to be more lethal as they are closer to the public, compared to the pollutants released by industries. During 1986-87, the vehicles plying on the roads of Delhi were emitting about 865 tonnes of pollutants every day. Since then, the number of vehicles in Delhi has doubled.

During the post-Independence period, Indian cities have expanded spatially to accommodate the growing population and increasing economic activities. The increasing distances between home and work place have forced urban dwellers to commute long distances. The expansion of public transport has not been commensurate with the growth of population. As a result, private vehicles have witnessed a rapid increase. In Delhi, there were only one lakh two-wheelers in 1971 and today there are about 14 lakh two-wheelers although Delhi's population has grown only 2.3 times during 1971-91. Delhi has the highest number of vehicles in the country - 22 vehicles per 100 persons, while Bombay and Ahmedabad have six and 15 vehicles per 100 persons respectively The increase in vehicles has led to more road accidents The rate of fatalities is the highest in Delhi - 18.87 per one lakh population.

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[13] TERI 1996 *Strategy paper for reducing urban air pollution* Submitted to the Ministry of Urban Affairs and Employment. GOI. p.7.

Table 3.5. Ambient air quality statistics in selected cities in India

Cities	*Sulphur dioxide (SO_2)*			*Nitrogen dioxide (NO_2)*			*Particulate (SPM)*		
	Min	*Mean*	*Max*	*Min*	*Mean*	*Max*	*Min*	*Mean*	*Max*
Ahmedabad (0102)	5.0	54.5	156.5	7.0	35.8	125	117	327	946
Surat (0023)	4.0	18.9	100.7	8.8	33.4	89	68	378	792
Faridabad (0072)	16.7	31.3	39.5	6.8	12.6	20	139	275	425
Bangalore (0072)	8.8	33.4	101.9	5.0	17.4	48	70	204	1029
Pune (0052)	BDL	11.6	70.7	6.5	41.6	136	41	182	389
Madras (0038)	BDL	22.5	133.9	2.0	22.2	81	55	180	384
Agra (0001)	3.3	19.7	42.7	3.2	10.3	20	170	427	850
Howrah (0009)	4.1	29.4	147.2	23.0	95.3	311	71	275	628
Delhi (0055)	BDL	13.0	41.5	BDL	17.5	39	56	331	1062

Source
Central Pollution Control Board 1990. *Ambient Air Quality Status of Some Cities/Towns in India*, New Delhi.

The changes in the modal shares, increase in public transport modes, improvement in engine efficiencies, alternative modes of transport, etc., are some of the ways that have been popularly voiced as strategies for this sector. Although, this sector in the planning sense as described above, is not the ambit of the LGs, they do have the responsibility of "urban planning including town planning" and "roads and bridges." Also, the "protection of the urban environment" has been recently (as per the 74th Constitutional Amendment) been brought under the functions of the LGs.

Transport planning is inextricably linked with urban development and land use planning. The planning of transport infrastructures such as roads, highways, railways, etc., to deal with the increasing income levels and demands on personalized transport, should be given attention. This infrastructure planning should incorporate the environmental concerns (especially air pollution) related to the transport sector.

In the past large development projects have rarely been located in urban areas. What is more commonly observed is that townships develop around such projects. As these townships grow in size, the population that is exposed to pollution from the existing projects also increases.

As regards projects that have recently been implemented, even though they may be located outside urban limits they may not be far enough to have negligible influence on the urban environment. These influences would of course be dependent on the size and type of project; geographical and climatic conditions

The urban projects that impact on the local environment significantly are development of housing, road, commercial centres and market places. Certainly during the construction phase of such projects the impacts are obvious - dust pollution, noise debris etc. Considerable water resources are also utilized during this phase But perhaps less obvious, yet more important, are the secondary effect during the operational phase such as increase in traffic, greater human activity implying more consumption of power and water.

The problem is compounded by the fact that the various agencies responsible for urban development do not coordinate their activities. Quantified data on environmental impacts of urban development projects hardly exist in India. The categories of projects that require EIA clearance does not include urban projects. This is one reason for paucity of data. Urban development has so far been project-based and not policy-based. It has also emphasised "places" more often than people.

Pre-planning measures that would minimise the adverse impacts of development include siting guidelines; rapid-EIA, and public consultation. As regards EIA it would be essential for most urban projects to look separately at impacts during the construction and operation phases. The EMPs would need to be integrated into the district and metropolitan master plans. These aspects are discussed in detail in Chapter 7. The role of inter-agency cooperation in even more crucial in urban areas and cannot be over-emphasized.

With this Chapter putting into context the status of the urban environment and the problems/issues related to infrastructure services provided, the following sections of the report will look at the organizational, legal and financial aspects that have resulted in this situation Recommendations/suggestions are also given.

CHAPTER 4

Organizational aspects

Introduction

The organizational structure of a local government probably plays the most crucial role in the management and development of the urban system. As the decision-support system, the responsibility levels within any LG should be conducive to open interaction. Also, the structure should allow for the flow of information from one level to the other, and from one LG to the other. Since today, the LGs have given little focus on planning with environmental considerations, it is more crucial with the 74th Constitutional Amendment, which gives the LG environmental responsibility, that the organizational structure/linkages be clear

Infrastructure development which is so closely linked with the urban environment is the prime responsibility of the LGs and parastatal organizations. The dismal level and quality of infrastructure provision to the community as seen today (refer Chapter 3), reveals that there is something not quite right with either the system of urban planning, or implementation of the planning done, or both. Past experiences say that both are weak - planning, because this is not adequately integrated into plans of other parastatal organizations, and implementation because of either financial constraints, and/or technical "not-know-how".

The LGs carry among others (listed in Schedule 12 of the 74th Amendment [in Chapter 6]) the important responsibility of clean water supply, sanitation and sewerage disposal. This Amendment, has put additional responsibilities/functions on the LGs, which includes environmental responsibilities (urban forestry and in general environmental protection and safeguard). For the former functions, LGs take inputs from officials and have formed committees to address the issues from the perspective of infrastructure development and provision of services for the community, but there is very little environmental planning or design in this. So how are the LGs to take on this additional responsibility? What organizational form is required for this? What capacities need to be built? What planning tools are needed to assist the LGs in carrying out these functions?

This chapter looks at the present institutional structure of the LGs to answer the above questions in the context of the environmental concerns stated in Chapter 3. It also proposes the possible inter-linkages necessary between the different LGs (municipal corporations, municipal councils and *nagar panchayats*) and the parastatal organizations, and the LGs and the state and central governments.

Brief history of local governments in India

The system of local (or decentralized) governance in India goes back a long way. The *Panchayati Raj* or rural decentralization was present since the mid 16th Century. There was some form of LG present in the Mughal period as well (Table 4.1). Once the British came in, the system of LG changed and is more or less what it is today.

Table 4.1. Evolution of local governments in India

Period	Form
1687 - 1881	LG was viewed & utilized to ease central & provincial finances & thus to subserve the imperial needs
1882 - 1919	LG began to be viewed as a self government
1920 - 1937	LG came within the jurisdiction of provinces & further was transferred to popular control
1938 - 1949	LG was in a state of repair & reconstruction
1950 - 1992	LG has been tuned to the requirements of the constitution
1992 - Present	LG has constitutional status

Source

Dr Shriram Maheshwari. 1977. *Local government in India*. p. 12.

The first municipal corporation was set up in Madras in 1687. In 1909 a historically significant report was brought out *Royal Commission Report on Decentralization* which made recommendations primary of which were the following:

- The village should be regarded as a basic unit to the LG and the municipalities in the urban areas.
- The LG should be an elected body.
- The LG should be given the authority/powers to collect and determine the taxes.
- Outside control over the local bodies should be restricted.

In spite of this very little was achieved in terms of actual decentralization. In 1957 a 3-tier system of rural LG emerged in most states:

- *Zilla parishad* at the district level
- *Panchayati samiti* at the block level.
- The *panchayat* at the village level.

The urban LG was slow to develop in comparison with that of the rural local government system. It was only in the Third Five Year Plan that urbanization was recognized to be increasing and that it would be a serious future problem in India. There were only three corporation towns in 1947 and in 1969 there were 30.

The urban LGs were under the Ministry of Health, Family Planning, Works, Housing and Urban Development. The Cantonment sections of the urban areas were under the Ministry of Defense At the state level, the urban LG was the responsibility of the Department of Local Self-Government.

Present structure of LGs

As indicated earlier, the present structure of the administrative system has not changed very much over the years (Fig 4.1). With the recent 74th Constitutional Amendment, several municipalities have made amendments in their acts for the evolution of a more decentralized administrative system. The Amendment recognizes three levels of governments·

- Municipal corporations (large urban areas).
- Municipal councils (smaller urban areas).
- *Nagar panchayats* (areas under rural to urban transition)

A metropolitan area[1] is defined as an area having a population of ten lakhs or more, comprised in one or more districts and consisting of one or more municipalities/*panchayats* or other contiguous areas The basis of classification has been on (a) population numbers; (b) density of population, © revenue generated for the local administration; (d) percentage of employment in non-agricultural activities; (e) the economic importance; and others. All the local bodies are represented by members of the House of the People, Legislative Assembly, Council of States, Legislative Council of the State registered as electors within municipal areas, chairpersons of committees constituted under Clause (5) of Article 243S. Ward committees consisting of one or more wards will be constituted, within the territorial area of a municipality having a population of three lakhs or more. Many urban centres in the country already have wards and ward committees

The same needs to be done for aspects related to urban environment management, which is at present largely central and state domains. The formation of District and the Metropolitan Planning Committees is a move in the right direction, but the powers and functions of these should be clearly defined Figure 4.2 gives the present linkages between the different government levels in environmental responsibility.

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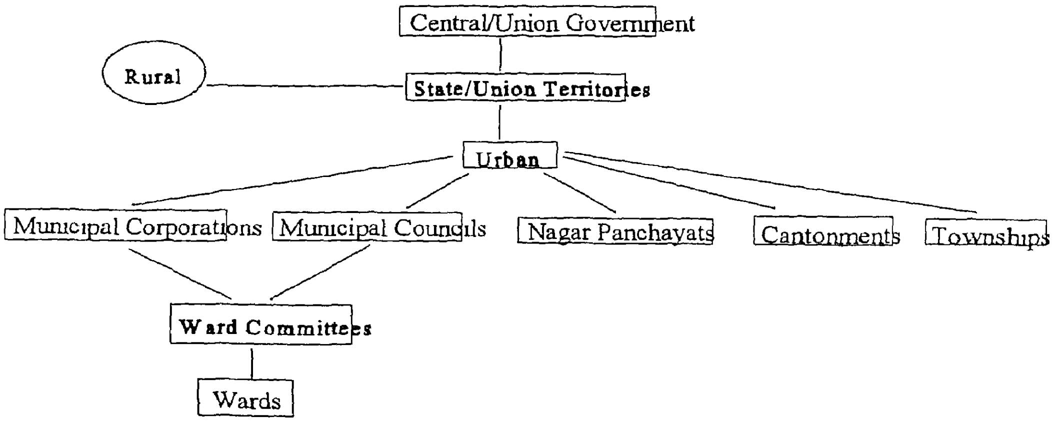
[1] Bakshi P M 1996 *The Constitution of India*. Part IXA The Municipalities Universal Law Publishing Co. Private Limited, Delhi p.187



Present organizational structure of urban local governments

Fig 4.1

Table 4.2. Environmental responsibilities at various government levels.

Institution	*Environmental responsibility*
Central government - Ministry of Environment & Forests (and the parastatal organizations) - Ministry of Urban Affairs & Employment (and the parastatal organizations) - Planning Commission	■ Environmental and developmental policy setting ■ Environmental compliance monitoring and evaluation ■ Setting of environmental guidelines, standards and norms ■ Decisions on environmental legislation at the national level
State government - State Ministry of Environment & Forests - Development Authorities - Town & Country Planning Organizations	■ Environmental compliance and evaluation ■ Setting of specific standards and guidelines ■ Land use planning, regulations and development ■ Regional planning
Local government	■ Public health ■ Water supply, sewerage and sanitation ■ Urban forestry ■ Environmental protection and conservation

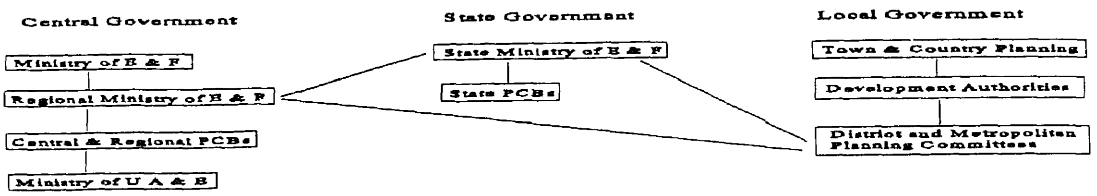
Source

Compiled by TERI, 1996

Local level institutions

At present the local level (urban settlement level) the responsibility for physical planning consists of different agencies. This structure operates with a master plan/development plan, state/national priority scheme, and day-to-day development issues of approvals and controls within its respective jurisdiction. The organizations responsible for physical (and to a small extent policy) planning at the local level includes the following agencies - municipal corporations, improvement trusts, development authorities, notified area committees, town area committees, townships, cantonment boards, new towns, etc

Within the municipal bodies, the structure is primarily hierarchial with the commissioner (or equivalent in smaller urban LGs) being elected for a period of five years. Several committees are formed to look at the functions as listed in the Constitution, such as water and sanitation, sewerage, public health, law and order, housing, etc Financial advisors from different administrative services are deputed to help decide the various aspects including the expenditure/budget and other programmes. The plans prepared by them are forwarded to the state administration for planning the budgets and outlays



Present environmental institutions and inter-organisational linkages

Fig. 4 2

With reference to environmental concerns/issues, LGs play a very small role at present. The 74th Amendment has included in its functions the "urban forestry, protection of the environment and promotion of ecological aspects". Although almost all the other functions in some way or the other could affect a change in the local environment, there is no special cell within the LGs that look at environment in an overall way, through its integration into planning.

A look at the different forms of LGs that exist in the country and the kind of environmental responsibilities they have, indicate that institutional decentralization exists upto the level of the state. This needs to be changed to incorporate 74th Amendment duties into the ambit of the LGs. Also, there is the basic need to build capacities which will help incorporate environmental concerns in planning, through management tools, legal backing and financial powers to undertake these functions

An outline of the different levels of local government and their primary responsibilities (including environmental, if any) is given below.

Municipalities

These bodies were created by the colonial rulers to mobilize local fiscal resources for local works such as water supply, drainage, primary education, public health, roads and streets, parks and play-grounds, street lighting as well as enforcing building bye-laws and maintenance of local police force. Later reforms were introduced wherein elections were brought into local bodies, ultimately ending up with the process of introducing an elected council with an elected Chairman. by 1920 under the Montague-Chelmsford Reforms. Most of the small and medium towns and cities in India are governed by municipal councils or committees or boards.

They carry out the physical planning and development activities as stipulated under the Acts. They tend to fill the gaps left by State Town and Country Planning Department. They can even execute the schemes prepared by the Town and Country Planning Departments. The LGs are responsible for the enforcement and regulatory functions, the planning of growth and expansion and development of urban infrastructure, levy, assessment and collection of taxes and other revenues, management and maintenance of public properties, and raising of resources and provision of daily services etc. The local bodies though assigned these sort of major development, planning and maintenance works of urban centers.

Municipal corporations

The big and metropolitan cities are governed by municipal corporations. These bodies are different from the municipalities in the sense that they enjoy higher degree of autonomy and have direct contact with the state government and the people. They are more democratic in constitution and have more resources at their disposal. Their obligatory functions (such as maintenance of public roads and streets, public health, sanitation, education, vital statistics, regulation of trade and commerce and water supply), and discretionary functions (such as public housing, public construction, transport and electricity). Their functions are of the form of legislative rule making, civic, regulatory and developmental. The corporations have wide powers of taxation to exercise these functions, and thus they are better placed than other local bodies to execute their functions. All the above form of functions have elements of physical planning and development and hence, within their jurisdiction they can carry out any development, urban renewal and planning works. Most of the corporations have separate Town Planning Cells as well.

These large LGs could very easily be considered as independent states. Environmental responsibilities and functions as followed by the state agencies (Department of Environment, Pollution Control Boards, etc.) could be taken up by these large metropolitan local bodies. The monitoring, evaluation, planning and implementation of environmental programmes could be the responsibility of these LGs. These bodies should be responsible for raising revenue for environmental programmes, and also be guided by the relevant state and central laws.

Improvement trusts

At present these trusts are found at only very few places. The main tasks of improvement trusts are to acquire land, sub-divide the land into plots for houses, open spaces, schools, hospitals, other public facilities and roads and sell the plots for private ownership and development in accordance with the rules prescribed Development works such as construction of roads with street lights, drains, sewers, water supply and provision of electricity within the area covered by town planning schemes are undertaken by improvement trusts. Whereas, in some cities improvement trusts are involved in road widening works and development of adjacent areas, at some other places they are engaged in improving extremely congested areas by slum clearance, and undertaking housing projects for the low-income groups.

Wherever the improvement trusts exist, they should function as a subsidiary body (similar to the ward committees) of the LG in providing environmental service to the community. Monitoring, reporting and small implementation projects which require close involvement of the community, the improvement trusts could be made responsible.

Notified area committees

This form of LG is generally notified for urban areas which does not become mature enough to have municipal status They can perform only those functions as notified in the government gazette. However, they dc possible physical development for the settlement for which they are notified. They also maintain the services and facilities in their settlements. These committees are categorized as non-representative form of LG but they operate under the state municipal acts. They are constituted in the States of Bihar, Haryana, Madhya Pradesh, Karnataka, Punjab and West Bengal.

Again, where these exist they should perform the functions as stated for the improvement trusts (above).

Town area committees

These committees do civic, regulatory and development functions. Their important functions include street lighting, drainage and conservancy They are also responsible for repair and demolition of dangerous buildings. These committees are placed next to municipalities but these are quasi-municipality type of LG, as some of its members are elected and some are nominated by the government.

These LGs could play a significant role in the protection of immediate environment and education of the community on issues related to environment. Apart from this they could also perform the functions as that specified for the improvement trusts.

Townships

Township is a bureaucratic form of government and is found generally around single industrial settlements, industrial complexes and in small towns. These townships are established where high standard of civic services are provided at high cost. Townships perform functions of providing services like water supply, electricity, drainage, sewerage and other community facilities.

These LGs have a very high capability to perform environment protection duties. They also have the opportunity to include the environmental and natural resource costs to services provided to the community, since this community would be more willing to pay. Also, if it is an industrial township, the LG could raise revenue by applying the polluter-pays principle. The quality of the services could be very high and therefore the environmental quality could also be maintained over a longer period.

Cantonment boards

These boards are generally found in military cantonments having military and civil personnel. They function directly under the Ministry of Defense and are less democratic in nature. There are about 60 cantonment boards in the country. These bodies have obligatory functions of street lighting, sweeping of streets, regulation of dangerous and offensive trades and water supply Discretionary works includes reclamation of unhealthy localities, provision of electricity, transport, etc.

These boards have in general maintained a good environmental ambiance of their areas in most parts of the country. Also, the provision of basic services is quite high. Experiences from these LGs could be duplicated by other LGs.

New towns

The 'new towns' were formed mainly for the purpose of housing a large industrial plant in most cases and administrative refugee rehabilitation purposes. Later fully planned towns with all services and amenities were created. All these towns are special purpose towns and 100 such towns are developed since independence. New towns are symbols of emphasis on urbanization and on physical planning.

Development authorities

The development authorities have been created to do mainly the physical development works including execution of development (master) plans within the area delimited for the authority The first development authority was created in Delhi in 1957 and later Calcutta, Madras and other metropolitan cities established these authorities This form of organization grew very fast and today there are about 100 such authorities functioning in India. These authorities are given wide powers of acquisition and development of land, and its disposal besides carrying out other developmental activities. Most of these authorities, particularly which are in Delhi, Madras and Bombay have also planning works assigned to them These authorities are contributing substantially in taking forward the development activities in big cities and Metropolitan areas.

Today at the local level, these development authorities probably have the most powers and finances to undertake developmental work. Their efforts and planning need to be streamlined and environmentally focussed. The development authorities should work in conjunction with the newly formed district and metropolitan planning committees and the LG, to decide on environmental and service priorities for the area.

State level institutions

All the states and UTs have departments looking after environment and forests, collectively or singly In addition, most of the states have State Pollution Control Boards (SPCBs). Some of the states also have specialized institutes like the Kerala Forest Research Institute, Kerala, the Madhya Pradesh Forest Research Institute, the Environmental Protection and Coordination Agency (EPCO), Madhya Pradesh, Environment Protection and Training Institute, Andhra Pradesh or the State Wastelands Development Board, Maharashtra. The SPCBs have a significant role to play in environmental monitoring and pollution control.

The State Town and Country Planning Department, Housing Board, Slum Board, Town Planning Wings of some departments, Department of Environment & Forests and the

SPCBs are the agencies of the state government that deal with the subject of physical planning, environment and development. These agencies are created under special acts for special functions.

Town planning authorities

In the past, the functions of the State Town Planning Departments have been limited to the preparation of general development plans. Gradually, the responsibilities of these departments have been widened and there was growing realization that these departments must be entrusted with the task of preparing a comprehensive physical planning framework for each urban area and within this framework fitting the various developments proposed by different departments of the states.

The general functions of the state level Town Planning Departments include (a) advising the state governments in all matters of town and country planning including legislation, (b) planning policy and programmmes relating to urban and regional planning, © location of industry and other important projects, (d) technical assistance and advice to local authorities in the preparation and enforcement of master plans, (e) preparation of planning schemes involving housing, (f) rural planning and housing, and (g) regional planning of priority areas in the state.

State Ministry of Environment and Forests

The state ministry of environment and forests performs the tasks of policy development, coordination with its various wings such as, the forest department, the pollution control boards, and others. It decides the functions, responsibilities, powers and programmes of its various departments. Overall environmental priority-setting, programme development and monitoring is carried out by this agency.

State Pollution Control Boards (SPCBs)

The SPCBs are responsible for a range of activities which include monitoring of compliance, setting of some specific standards, preparation of environmental zonal maps, studies on environmentally stressed areas, conservation of sensitive zones, etc. One of their important functions is to bring environmentally violating industries to the front and force them to comply with the standards.

National level institutions

The main national level institution with environmental responsibilities/functions is the Ministry of Environment and Forests. The Some of the agencies are the Planning Commission (Housing and Urban Development Division), Ministry of Urban Development, and the Town and Country Planning Organization.

Ministry of Environment and Forests (MoEF)

The MoEF is the nodal agency in the Central Government for the planning, promotion and co-ordination of environmental, and forestry programmes. It formulates policies, regulations and decides on the priorities of environmental action for the country as a whole. The MoEF has several arms, which deal in various aspects of the environment; those relevant to the urban context are the central pollution control board, the regional and the state environment ministries. There are five regional offices which play the role of monitoring of compliance of projects cleared by the central government. They are governed by the central acts and regulations while the state (environment) ministry and the state PCBs mainly deal with the state legislatures. The regional offices of the CPCBs also play a similar role.

Planning Commission

The Planning Commission, as in other sectors decides on the total quantum of resources that are to be devoted to urban development for the country as a whole. It further allocates these resources between states and between schemes both for the central sector and state sector activities. Urban development investments are mainly in the state sector except for some specific central sector schemes.

The Perspective Planning Division (PPD) is responsible for inter sectoral consistency and coordination as well as for long term projections for the country as a whole, disaggregate sectorally. The other division that has considerable responsibility for physical planning related issues is the Transport Division which is responsible for urban transport policy as well.

Ministry of Urban Affairs & Employment (MUAE)

This Ministry is responsible for formulating nation-wide policies/programmes and their implementation The Ministry has a separate Urban Development Division headed by a Joint Secretary There are other divisions like a separate division for housing Agencies like Housi and Urban Development Corporation (HUDCO), National Institute of Urban Affairs, etc , ai controlled by this Ministry. Central Public Works Department, Central Public Health Engineering Organization, National Buildings Organization (NBO) and Town and Country Planning Organization work as its attached/sub-ordinate offices.

Integrated Development of Small and Medium Towns (IDSMT) was launched on the recommendations of the Task Force on Small and Medium Towns and Cities (1977). IDMST has main objectives of pooling resources for development of small and medium towns so that these towns can generate enough economic opportunities and livable environment in such towns and ultimately can become capable or arresting migrants heading for big and metropolitan cities.

Town and Country Planning Organization (TCPO)

Its main function is to assist and advise the Ministry in the matters related to planning aspects of towns. It also carries out central sector projects and commitments of the central government. The TCPO was instrumental in creating the State Town and Country Planning Departments and presented a Model Regional and Urban Planning Act to be followed by the states The first ever master plan of any city of India, ie., of Delhi was prepared, by TCPO. It was the first to incorporate regional perspective in planning and subsequently National Capital Region (NCR) was demarcated To increase physical input on regional basis it prepared a detailed plan for South East Resource Region. Various guidelines and manuals for preparation of physical plans for settlements were prepared after detailed survey and analysis. These manuals are being followed by many States which look forward to it for guidance

The School of Planning and Architecture, New Delhi, which is a deemed University, is an important educational institution imparting educational facilities on various aspects of physical planning. The School also provides facilities for research, training and extension programmes.

Regional planning efforts

Regional perspective of the settlements is lost sight of as the development authorities concentrate on a particular settlement. This problem was recognized long ago and efforts have been made to diffuse it. Regional plans were prepared for several metropolitan regions and they include Bombay Metropolitan Region, Pune Metropolitan Region, Nagpur Metropolitan Region, Ahmedabad Metropolitan Region, Calcutta Metropolitan Region, Bangalore Metropolitan Region and National Capital Region. The above efforts, however, are not adequate There are number of cities which have larger region than the planner expects or demarcates. There is a need for an overall settlement policy.

At present regional/spatial development concept does not form an integral part of the national planning process. Regional planning at central level has been an inter-state level exercise. Regional plan for the National Capital Region (NCR) was the first in this aspect The Third Five Year Plan emphasized the need for a balanced regional development and provided for the preparation of regional development plans for five resource regions namely Damodar

Valley, Dandakaranya, Rihand, Bhakra Nangal and Rajasthan Canal In some cases, the regional plans have taken note of problem areas which are common to adjacent States, as in the case of Chambal Valley, where dacoit menace led to a joint plan for development of the area to rehabilitate the people and provide opportunity for their social establishment. The Western Ghats Regional Development Programmes aim at the economic well-being of the people of the hill area, keeping in view the vital importance of ecological restoration and conservation.

District and Metropolitan Planning Committees

The 74th Amendment has provided for the creation of twin planning committees for district and metropolitan areas for finalizing municipal plans within their ambit, along with commitment of state and central assistance for the purpose. The committees are supposed to undertake planning for matters of common interest between the *panchayats* and municipalities, especially planning of physical and natural resources, infrastructure development and environmental conservation

States like Tamil Nadu, Maharashtra, Andhra Pradesh, Uttar Pradesh, Kerala, Gujarat, etc. have initiated work on the preparation of regional plans (1988). The State Government o Tamil Nadu has prepared a comprehensive scheme dividing the entire State into eight plannin regions and proceeded to formulate regional plan for each of these regions. The Andhra Pradesh Government has delineated the State into three planning regions for preparing comprehensive plans for them. In Maharashtra, regional plans for a number of regions have been prepared and approved by the Government for implementation. In Uttar Pradesh, the work on regional planning started during the Third Five Year Plan Period. In Madhya Prade ten planning regions have been notified for the preparation of regional plans and the State Town Planning Department has taken up the plan preparation task for these regions. In Punjab, a number of regional planning studies have been carried out and the State has been delineated into three major planning regions and twelve micro planning regions. In Kerala, t Department of Town Planning is engaged in the preparation of district development plans besides the preparation of a spatial development plan for the State as a whole. Regional pla for urban areas like Greater Cochin Region and Calicut Region are also being prepared

It is clear from the above discussion on the structure of the various government bo and their environmental responsibilities, that there is scope and the need to decentralize th environmental activities and functions right up to the LG level. With the 74th Amendment, environmental decentralization is seen upto the level of a few functional areas and the formation of the district and metropolitan planning committees For certain activities, furt decentralization is possible The primary issue has been the lack of incorporating environmental concerns into the local and regional planning system Infrastructure development and planning (i.e., the provision of basic amenities to the community) should include environmental priorities and concerns. Suggestions for this process, specifying some of the possible environmental functions is given below.

Capacity building of ULBs

Inadequate capacity in state pollution control boards and MoEF's regional offices is common across the country. Lack of expertise in environmental planning and monitoring of Environmental Management Plans and Audits; as well as inadequate number of professional staff are major problems. Staff are trained to deal only with industrial air and water pollution control, with the result that urban issues do not receive adequate attention

Ambient air is monitored by CPCB, NEERI and state agencies in about 60 cities and towns. Even here only three pollutants are regularly monitored There is scientific evidence that justifies the need to monitor a few more critical pollutants. But at present CPCB's capacity to handle more cities and pollutants is weak The network should be expanded to cover all the Class I cities (about 300 at present).

Capacity building for urban environmental management implies building technical, financial, and managerial capabilities of key actors at national, state, and local levels. The objectives of capacity building strategies for urban environmental management can be formulated in the following context[2]

- To create political and governmental commitments by evolving an agenda for local area development and incorporate the same in the plans at all three levels, national, state , and local.
- To create appropriate institutional arrangements backed up by effective training for monitoring, self correction, and improvement.
- To create awareness in municipalities and among people about problems and responsibilities, as well as in regard to sanitation and work and living conditions, which is catalytic in promoting direct community participation
- To encourage partnerships between local authorities, the community, the private sector, and NGOS.
- To achieve larger coverage through replication of selected best practices, create conditions for continuous improvement of the practices.

Some specific areas for capacity building would include: monitoring of the environment and quality of life indicators; training in legal, regulatory, and economic tools; modern forms of data acquisition and management (including GIS); information systems for public awareness and empowerment; and replication of best practices. *It would be necessary to equip ULBs with techniques to recognize environmental costs and their estimation procedure.*

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[2] HMSI and IHS 1996 Capacity building for the urban environment. New Delhi.

Suggestions/recommendations

The LG system that exists could very easily undertake the environmental responsibilities that have been stated in the 74th Amendment. But there is a definite need to define the environmental powers and functions (obligatory and optional), and required interlinkages between the different organizations. The following are suggested for the LGs and their detailed functions are defined in Table 4.3. Since the obligatory functions are listed in the 12th Schedule, the table specifies what should be the additional (or optional) functions of these bodies in order to carry out the objectives of the Local Agenda 21.

- At the institutional level, an **environmental unit** needs to be formed within each large LG, i.e., the municipal corporation and municipal council. This unit will oversee possible environmental implications of any developmental project within their jurisdiction. This environmental unit should comprise of technical and planning personnel. The primary responsibility of the cell would be to make policies, plan for a clean urban environment and monitor activities in the area. In smaller urban areas *(nagar panchayats)*, a representative with the knowledge of environmental issues should provide the necessary inputs in planning and coordination.
- A metropolitan region should function as independently as a state, even in carrying out the environmental functions, similar to that of the state. The environmental unit in an metropolitan area should be governed by the Municipal Acts and the environmental acts/laws being followed by the states.
- A **ward committee environmental representative** in each of the ward committees need to be nominated by the committee in consultation with the residents, who will undertake the responsibility of reporting or monitoring the environmental situation in the respective ward area. They would interact with the ward residents at regular intervals, and also be members to the environmental cell of the LG
- Any project that has been decided by the environmental unit, will need to undergo a **review, evaluation** (by the district/metropolitan planning committees) and a process of **public consultation** (by the ward committees). The **residents' associations** also need to be actively involved in the various decisions.

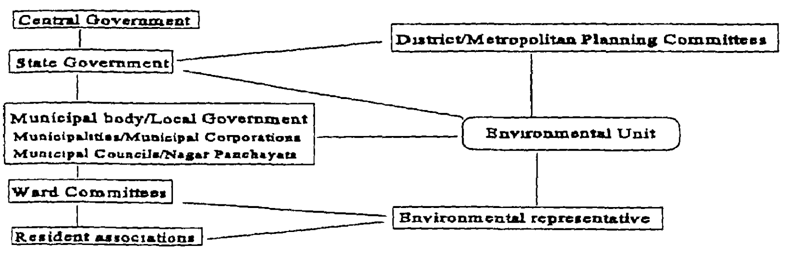
The environmental unit should have members from the newly formed **district and metropolitan planning committees** Regional plans to be prepared by these committees should include the ward level, and municipal level plans to get the holistic idea of the environmental effects of the regional plan. The district and metropolitan planning committees should be made responsible for all environmental planning aspects at the regional level and for that of the *nagar panchayats*.

Thus the present structure needs to be modified to include the above. A suggested structure is indicated in Figure 4.3.

Decentralized approach

The measures that are needed to negate the weaknesses of decentralized approach are·

- spill-over effects· the decentralized regulators have weak incentive to take into account spill-over effects of other jurisdictions. This can be overcome by a consultative process that also includes neighbouring jurisdictions. It would aslo be necessary for a sort of *consortium* of ULBs with common regional goals.
- economies of scale· when several jurisdictions collaborate to achieve economies of scale in case of large projects, then the effectiveness of the federal structure weakens To some extent with the help of alternative technologies, and alternative resources, the smaller jurisdictions may rely less on large infrastructure projects.
- constrained regulatory capacity. This problem can be resolved only by selectively assigning environmental duties and rights to ULBs The time frame over which the devolution is to occur will also determine how to augment the skills of staff.


Central Government
State Government
District/Metropolitan Planning Committees
Municipal body/Local Government
Municipalities/Municipal Corporations
Municipal Councils/Nagar Panchayats
Environmental Unit
Ward Committees
Environmental representative
Resident associations

Proposed institutional structure

Fig 4.3

Table 4.3. Proposed institutional environmental functions of LGs

Local body	*Environmental functions*	*Interlinkage areas*
Municipal corporation/council (Environmental unit)	***Overall functions*** - Function as a nodal agency that sets environmental polices and plans the city/town for environmental sustainability - Coordinate with the district or metropolitan planning committees in regional planning. ***Specific functions*** - Identify environmental priorities for the urban area - Develop specific time bound programmes in the priority areas (with the guidelines set in the Agenda 21) which would include those in (a) water supply and sanitation, (b) solid waste management; © clean energy, (d) transportation planning; and (e) land use planning - It should take in expertise (advise and representation) available in the existing state environmental departments and outside consultants. - These environmental units should equip and undertake all the responsibilities that is presently being done by the state environment departments. This would include (a) environmental quality monitoring; (b) programme planning and evaluation; etc. - Maintenance of environmental database, development of environmental indicators, review of development projects by the use of environmental impact assessment techniques and other management tool, etc - Raise finances for environmental programmes through taxes, schemes and encouraging private investments in certain areas.	***Local links*** - They will be the programme and planning authority of the representatives from the ward committees and residents' associations. - Specific functions of the representatives will be delegated by the environmental units - They will sit on all the relevant committees at the parastatal organizations that decide infrastructure development plans for the city ***Wider links*** - Annual plans will be formulated, budgeted and forwarded to the district/metropolitan planning committees for incorporation into the larger plans - Direct links with the state governments will be reduced. This will be maintained primarily to develop skills in the area of environment.
Ward committees (Representative)	***Overall function*** - The Ward Committees and the Wards will be responsible to implement and monitor environmental programmes (under the guidance of the environmental unit) within the ward area ***Specific functions*** - Environmental quality warning and monitoring will be conducted by these representatives - They will be responsible to implement certain activities such as * Greening of the ward areas and environmental upkeep * Solid waste management/collection * Planning and development of education programmes * Conducting public hearings of proposed projects in the area * Performance monitoring and upkeep of services/infrastructure provided by the LG, and also of programmes by the unit. * Feeding environmental information and data to the database maintained by the environmental unit.	-They will mediate between the environmental unit at the LG and the community

Table 4.3. contd.

Local body	*Environmental functions*	Interlinkage areas
Resident Associations (Representative)	***Overall function*** - These associations will function as "policing agents" and reporters of environmental/service needs and offences. ***Specific functions*** - They will function to transfer the specific service needs of the residents of the wards, to the representatives of the ward committees. - They will be responsible to report any environmental offence by a resident, industry or others.	- They will directly work under the ward representatives
District Planning Committee	***Overall function*** - They are already responsible for consolidating plans of the *panchayats* and the municipalities. It would be their primary function to incorporate regional environmental concerns into their planning system[3]. ***Specific functions*** - The would be responsible to provide guidance to the municipalities on what environmental aspects need to be incorporated in their area development plans. - They should function as the planning mediatory between the LG and the State, in the decision of fund allocations for infrastructure development and environmental protection - They would have the prime responsibility of local environmental planning for the *nagar panchayats*.	- They should have links with the State Planning Boards, the State Finance Commission, the state environmental organizations (Environment Ministry, PCBs, etc) and other parastatal organizations - They will interact with the metropolitan planning committees and the LGs. - They will interact with the *nagar panchayats* in the preparation of the local development plans.
Metropolitan Planning Committee	***Overall function*** - These have the set (74th Amendment) of preparing the draft development plans for the metropolitan region as a whole. They will provide the same functions as that of the District Planning Committee at the metropolitan level. In addition, the Committee will work in conjunction with the metropolitan LG	

The Constitution of India (Bakshi P M. 1996. Universal Law Publishing Co. Pvt.Limited. p. 192), states that the district and metropolitan planning committees shall, 'in preparing the draft development plans have regard to matters of common interest between the *panchayats* and the municipalities including spatial planning, sharing of water and other physical and natural resources, the integrated development of infrastructure and environmental conservation .."

CHAPTER 5

Municipal finance

Introduction

Having increased the functional responsibilities of local governments, with the passing of the 74th Amendment, it is evident that to discharge them effectively, they should be allowed access to matching sources of finance. The task of providing satisfactory levels of civic services and urban infrastructures is no mean one; already the gaps are visible, and with growing urbanization and development and the consequent demands on the urban infrastructure, the provision of these is only likely to become more of a challenge. On the other hand the finances of municipalities today are very limited. In 1993-94, municipalities in India raised total revenues of Rs. 3,900 crore or Rs. 205.30 per capita, amounting to just 4.6% of revenues raised by the center, and 0.6% of the country's gross domestic product (GDP)[1]. In comparison the estimated investment required for infrastructure augmentation including water, sanitation, solid waste management, roads and street lighting at 1990-91 prices during the next decade alone amounts to nearly Rs. 39,000 crore[2] (Table 5.1). Yet the provision of these is the first step toward protecting the urban environment.

Though the five year plans provide for allocation of funds for urban infrastructure development through the central and state plans and agencies like the Life Insurance Corporation (LIC) and HUDCO, this has usually not exceeded 5% of the total plan outlay. The tight fiscal position of the higher level governments (state and centre) and proposed reforms in the financial sector are likely to mean that the mandated funds flowing to this area are likely to decline further. The need for measures to raise the revenues of municipalities and for new approaches to infrastructure financing are clearly evident.

This chapter attempts a review of municipal finances and make suggestions for meeting the challenge of provisioning urban infrastructure and basic services necessary to protect the urban environment, while maintaining the financial autonomy of municipal bodies.

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[1] National Institute of Public Finance and Policy. May 1995. *Redefining State-Municipal Fiscal Relations*. Vol. I. p. 8.

[2] Mehta M. March 1996. *Background reading material for Programme on energy environment resources and sustainability (PEERS)*

Table 5.1. Investment requirements for urban infrastructure (Rs.crore at 1991-92 prices)

Level of service (at current unit costs with 50% real increase in costs)	Average annual investment requirements (1991-2000)
Low	3530 5295
High	4993 7519

Source
Mehta and Satyanarayana (1994).

Table 5.2. Estimated sources of finance from 1992-97 (Rs.crore at 1991-92 prices)

Sources of finance	*Average annual flow*
Plan allocations during the Eighth Plans*	
Central plan	73
State plans	1497
Institutional sources'*	
HUDCO	250
Bilateral/ Multilateral agencies'	200
Internal sources'**	
Municipal authorities'	55
Parastatal agencies'	25
TOTAL	2100

Sources
* Mehta and Satyanarayana (1994)
** Dinesh Mehta (1995), and HUDCO (1995).

Review of local finances

The LGs finances are mainly in four forms, revenue, non-revenue, plan and non-plan. This form is prevalent at all the LG levels, i.e., nagar panchayat, municipal corporation and municipal councils. The plan revenue comes from the state government (except in the case of Delhi where the plan revenue for the New Delhi Metropolitan Council (NDMC) comes from the Home Ministry). The outlays on urban development for the Eighth Plan[3] reflect the thrust area to be IDSMT for which actual expenditure in the Seventh Plan (1985-90) was Rs. 80.03 crores are enhanced to Rs. 145 crores as central assistance

The revenue of municipalities comes from mainly four sources:

- Tax revenue where taxes directly collected by the municipalities.
- Transfers from the state government.
- Non-tax revenues from user charges, duties, tolls and fees.
- Grants from the state government.

Financial powers of the LGs

The financial powers defined in the Constitution are primarily shared by the centre and the state The financial function of the local bodies is to raise local taxes and generate revenue for the fulfilment of the functions divested on them. The municipal fiscal structure is characterized by three distinct patterns (I) predominance of octroi - a municipal import duty - and a subsidiary of property tax, with nominal state transfers, (ii) property tax as a major tax, supplemented by entertainment and shows taxes, non-tax revenue, and limited state transfers, and (iii) property as the main municipal tax and major dependence on state transfers. Octroi has been abolished in Andhra Pradesh, Karnataka, Madhya Pradesh, Himachal Pradesh and Jammu and Kashmir.

As per the Constitution, the LGs can impose the following taxes:

- Taxes on property consisting of:
  - a general house tax
  - water tax
  - drainage/conservancy tax
  - a lighting rate (in some cases electricity tax also)
  - a fire tax
  - education cess
- Octroi/terminal tax/toll.
- Tax on profession, trades, callings and employment.
- Tax on vehicles, carriages and carts, boats or vessels, animals and dogs.
- Tax on advertisements other than those in newspapers.

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[3] GOI. Planning Commission 1992-97. *Eighth Five Year Plan.* Vol II. p.359.

- Licence or permit fees in all cases where a permission ir sanction of an authority of the corporation is required to be given including sanction of the building plans.
- Show tax or theater tax.
- Betterment charges equal to half the increase in value of property affected by a redevelopment or improvement scheme.

Tax incomes contribute 60-75% of the internal resources raised by the municipalities, of which property taxes and octroi (where it is levied) account for more than half. Non-tax charges account for only around 25-40% of own revenues. But as seen in Table 5.3, there are significant variations, not only between different population sizes but also within each class. For West Bengal own revenues accounted for only around 28% of total resources, while this share was significantly higher (more than 85%) for the octroi levying states of Gujarat, Punjab and Maharashtra. These are also the states where the percentage contribution of shared taxes to total revenue is very small.

There is a tendency for grants to become less significant compared to total revenues with the increasing size of the city. In actual terms, municipalities with populations more than 5 lakhs receive almost 50% of total grants to urban local bodies. The variations across states are however much larger. Grants account for more than 30% of the total revenues in West Bengal, but are only around 3% in Kerala. These grants come in many names and there seems to be no guiding principle in their allocation. The quantum of grants in any year is often unpredictable, so forward planning is difficult. There is today a felt need to move beyond the budget constrained infrastructure provisioning which seems to be the rule till now, and allow local bodies to plan for a longer time horizon.

Table 5.3. Share in total revenue of sample municipalities for 1991-92 (%)

States	*< 100,000*	*100,000 to 200,000*	*200,000 to 500,000*	*> 500,000*	*Total*
Own revenues	27-87	28-88	28-88	60-93	29-91
- Property tax (%)	8-62	8-71	10-65	11-85	10-70
- Non-tax revenues (%)	16-42	15-45	8-35	10-21	14-42
Shared revenues	1-28	1-28	2-28	0 3-31	0 5-32
Grants-in-aid	9-40	3-35	4-25	3-10	3-31

Source

NIPFP, Redefining State-Municipal Fiscal Relations, Vol I

Tax structure

Taxes form the main source of own revenues for the urban LGs and thus the appropriate assignment of taxes to the municipalities and their exploitation by them can go a long way in improving their general fiscal position, and hence their ability to meet the challenge of protecting the urban environment.

The present tax base of the municipalities is both narrow and inelastic. While a number of taxes are levied by the municipalities, the largest and most stable revenues are earned through the property and the octroi tax where it is permitted. But the latter are not considered to be in the national interest and attempts are being made to abolish it But the octroi is both elastic and buoyant, and an important source of revenue for municipalities in the octroi levying states. In 1991-92, octroi collection for the Greater Bombay Municipal Corporation was about six times higher than that from the general property tax. Property tax has been non-buoyant and has run into serious problems of book-keeping. In conjunction with rapidly increasing expenditures, a non-buoyant and inelastic tax structure implies increasing dependence on transfers from the state over time

Property tax

The property tax is the single largest source of municipal tax revenue in the non-octroi states But being a direct tax, it has high visibility and its effect is proportionately higher on the wealthier, more influential section of society so it is often politically difficult to raise tax rates In many cases the rates charged are fixed at the minimum level specified by the state government. Moreover municipalities face the problems of bad book-keeping like irregular updating of assessed values, poor tax mapping, lack of transparency in assessing property values and also the numerous exemptions granted by the state, poor collection rates and legal problems. Historically, therefore, this tax has been non-buoyant and has not been able to keep up with the rapid rise in real estate prices over the past two decades[1].

There is an urgent need to reform the property tax system to improve its yields and make it more buoyant:

- The tax structure should be simple and transparent. Apart from government buildings, there is no justification for exempting any other type of building like schools, hospitals etc., from the purview of this tax. They impose a burden on urban infrastructures and are therefore liable to pay taxes as their share toward its provision.
- It may be preferable to charge an area-based tax. This was tried out in most municipal bodies in Andhra Pradesh resulting in a doubling of the revenue yield with collection rates touching 93% in some cases. This also has the advantage that vacant land also becomes taxable to the same extent as a built-up property. Consequently, there is a cost attached to leaving land unoccupied, and an incentive to build on it. The land values in a particular area may be taken as equal to the simple average of land values

declared for stamp duty purposes in a specified area or zone over the past three years to simplify assessment procedures.

Other taxes

Applying the congruence principle (i.e., that the less mobile and the more localized the tax base and ownership, the lower the level of government to which it should be assigned) an argument can be made to assign profession taxes, advertisement and entertainment taxes entirely to the LGs. These can inject some buoyancy into their tax revenues. The current practice in many states is that they are collected by the states and shared with the municipality despite their being "local" taxes.

Shared taxes and grants

The fiscal position of the municipalities can also be improved by the state government sharing some of the state level taxes with them. The motor tax and stamp duty are some eligible candidates for sharing, for these are taxes with a pronounced urban bias. But sharing a fixed percentage out of the global pool of state revenues would allow the local bodies access to the more buoyant state taxes while also meeting the criterion of transparency and predictability to allow the local bodies to carry out forward planning. The formula for distribution of this pool could be partly in the form of a block per capita basis, but the larger portion should be toward trying to equalize differences in revenue potential between different municipalities and promoting better management. A formula where the volume of transfer to a specific municipality depends on the following criterion could be considered.

- Population.
- Distance, i.e., the distance between the per capita incomes in the richest municipality and the given one.
- Distance of an appropriately devised index of urban infrastructures for a municipality from the best in a similar category.
- Tax effort defined taking into account an appropriate indicator of the tax potential.

The State Finance Commissions (SFCs) could after analyses decide exactly how to define each of these criteria and what weightage to give them so as to create a system of incentives wherein each municipality tries to provide the best civic services and infrastructure to its people, and is provided with adequate financial support in its efforts.

Grants-in-aid from the state governments is often discretionary. Often they are a result of hard bargaining between the local bodies and the state governments, so their distribution is on an ad hoc basis with a no clearly discernable formula[1]. Further, there is often a time lag between the approval of a grant and its receipt by the municipal bodies. They therefore do not meet the twin objectives of transparency and predictability. They also tend to erode fiscal discipline as they break the link between local expenditure and local revenue effort. This also undermines the accountability of the LG to its people[4]. The current reliance of municipalities on grants must be reduced Grants should be given only when the local body is acting as the agent of a higher level of government in pursuing an agenda whose impacts are felt beyond its borders, like in the case of environmental issues.

State level pollution boards already exist in most states Monitoring of air and water pollution is being done by them. They have the responsibility of reporting on polluting industries and filing cases against them under the Air and Water Acts and other state legislatures. Penalties under these Acts are very low (undergoing revision) and are not presently collected by the PCBs The amount so collected could then be earmarked to be distributed among the local bodies for aiding their environment improvement programs, along with other central funds given for this purpose

Land development

Land is the most important asset available with the municipality, and its proper usage an important determiner of the urban environment. With the value of urban lands appreciating rapidly all over the country, the municipalities should try to use this to their advantage.At present some of this enhanced value is captured through the capital gains tax, stamp duty and other transfer charges. However, most of these being state taxes, the municipalities benefit only indirectly through transfers from the state government. But other innovative measures could be tried out. For example, vacant land lying with them could be developed into commercial, residential space or open space which could be either sold or maintained. If sold at an attractive rate, they could recover not only the development costs but also providing a source of funds for further development activities.

Cities are often products of history. Even other than slum development, there is the problem of providing old settled areas with today's infrastructural facilities. In order to finance infrastructure improvements in built up areas, 'valorification' or 'betterment' charges could be levied upon the property owners who benefit from such development. This scheme has been successfully tried abroad. In Bogota, in Colombia when urban development was especially rapid in 1969, valorification charges were almost two-thirds of property tax collections, and were a major source of finances to the local body.

However betterment charges are controversial since these involve imputing a figure for the benefit a property owner receives from the development. They are plagued by legal disputes and problems. Again cost overruns are difficult to pass off. The recovery from poorer areas may be low, and there would often be political pressure not to recover anything from them. The success of such schemes therefore requires careful planning and execution with the active involvement of the beneficiaries, effective collection and significant initial funding by the state governments since the recovery is possible only once the development has already taken place[5].

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[4] Amaresh Baghi. 1996. *Assistance to local bodies: A note*, National Conference on Local Body Finance, Madras, 14-15 March, 1996.

Variants of this model have already been tried out in various states. Many of the states levy a development charge when granting development permission to developers and other agencies to recover a part of the infrastructure costs. In Haryana they are also expected to provide for internal services themselves and recover the cost through the sale of plots. The maintenance of these then either is left to them, or can be transferred to the local body. However, in most cases the charges are low, not even enough to fully recover the costs.

Non-tax charges

As LGs perform the role of regulating trade and industry, constructional activities, registering births and deaths etc., it should issue license permits and levy fees to at least recover its costs of administration and surveillance.

User charges

While local taxes are appropriate to provide for the provision of services which benefit the local community at large, user charges are an appropriate means of raising resources where the benefits from the provision of a service flow largely to easily identifiable individuals. Economically, they are an efficient means of raising revenues as they satisfy the principle that individuals pay for what they get. In addition, pricing services per unit should lead to a more efficient utilization and less wastage of precious resources like water. International experience of user charges shows that they are preferred to general taxes. There is a trend toward user charges in the Organization for Economic Cooperation and Development (OECD) countries, with the share of these to the own source revenues of local bodies rising from 26% to 34% between 1961 and 1989 in the US, and from 7% in Canada in 1975 to 12% in 1990[5].

However, in India, though user charges are common, cost recovery through them seems to vary from anywhere between 20% and a 100% for different cities[6]. In many cases service charges are linked to the rateable value of property, and with the rent control act freezing rents, the revenues generated through them have also stagnated while costs rise. Even where per unit tariffs are charged, it is politically difficult to raise the rates to reasonable levels.

The argument advanced for not pricing services to fully recover costs has usually been that this would mean that the poor are priced out. However, subsidies in utility prices work regressively if the higher income households consume more of the subsidized services than the poorer ones On the other hand, subsidies certainly add to inefficiencies and hamper maintenance, growth and improvements in the system, as the cash-strapped utility has to depend on grants and transfers from outside, which are often quite unrelated to its requirements. But user cost pricing does require some information about the willingness to pay of the consumer. In the absence of this, it is difficult to determine an appropriate price which would be affordable to the poor. The willingness to pay is itself dependent on the quality of services provided. Given the current poor situation of civic services in most areas, confidence building has to be the essential first step if municipalities want to charge significantly higher rates for the services they provide now.

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[5] Mohanty P K 1995 Reforming municipal finances Some suggestions In the context of India's decentralization initiative October 1995 p

[6] NIUA 1995. *Guidelines for the State Finance Commissions: Report of the working groups*. p.

Water supply and sewerage

As expressed before, adequate supply of water and sewerage facilities are important determinants of urban environment quality. Improper treatment and disposal of sewerage are one of the most significant contributors to water pollution. These are also areas where the application of user charges appears most desirable. Water is a precious natural resource and must be conserved. User charges could achieve this if they fully reflect the real and the environmental cost of water supply.

User charges should be enough to at least recover the operating and maintenance costs. These have been estimated to range between Rs. 25 in metropolitan areas to a maximum of Rs. 60 per month for a family of four in smaller urban areas[7]. With the commercial and industrial sectors cross-subsidizing the domestic consumers, the charges for the latter would probably work out being lower than this. There is some evidence to suggest that in most cases these costs are recoverable, at least for big cities as the experience of New Delhi or Bombay would suggest.

It is suggested that the municipality should try and meet the capital expenditure of providing water supply through connection charges for new connections to the greatest extent possible. These connection charges should recover the actual installation charges. In addition, an annual water tax could be levied to create a capital fund to meet future expansion needs. This could be related to the assessed property value with the higher property value groups paying more and some of the lower property values being exempted. If this is not sufficient, then the municipality should try and meet its requirement through debt and from its resources generated from other sources.

Borrowing is recommended to meet capital costs because the long gestation and life of urban infrastructure projects and the resulting long stream of benefits justify debt financing. Given the large capital requirements of the local bodies and the difficult fiscal position of the states, it is possible that there may be no alternative to this. Further, if this is on commercial principles, then the local body will also have to adhere to market induced financial discipline, and there is thus an inbuilt incentive to rationalize tariffs.

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[7] NIUA.

The connection charges under this scheme may turn out to be quite stiff. In this case the lower income classes could be given credit in the form of an installment scheme. The installments could be collected along with the bills. In the case of slums and unregularised colonies where there are problems in providing house connections, some form of a community scheme may be appropriate. A common water connection could be supplied if the community could raise at least a certain percentage of the connection charges, the rest being subsidized by the LG. In addition a monthly or yearly water charge for water supply could be collected from the ward committee representative.

The operating revenues from water supply should be enough to meet its operating costs and its debt obligations. Since water is a precious resource, some innovation could be built into the tariffs by entitling every connection to a minimum lifeline rate at no charge, beyond which consumption could be charged per unit with increasing rates for higher consumption blocks.

In case of municipalities that lack the minimum scale of operations to be economic, or lack the ability or expertise to take on the responsibility of water supply, the duty could be passed over to the state water board.

For sewerage facilities similarly, lump sum charges must be collected to cover all or at least most of the capital costs of connection with the existing network Since it is difficult to charge according to use and given its close connection with water consumption, sewerage charges could be recovered through a surcharge on the water bill.

Solid waste management

Solid waste management (SWM) is another important issue in the context of the urban environment. The World Bank has noted that in almost all country groups the collection of urban solid wastes can be carried out more efficiently under contracts by the private sector[8]. This would appear to be true in India also. For example in New Bombay the private contractors cost for SWM were less than half those of the City of Industrial Development Corporation (CIDCO). Entrusting the collection of solid wastes to the private sector would reduce the burden on municipal resources, and with proper regulation might lead to a better provision of services even while yielding franchise income for the local body With the help of the ward committees and the resident associations, the community could be educated and involved in the process.

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[8] World Bank 1994. *World Development Report*

Table 5.4. Financial benefits from using the private sector for solid waste removal

Cost estimates	New Bombay	Rajkot	
	Solid waste management	Primary solid waste removal	Secondary solid waste removal
Municipal body	Rs 99 lakhs/year	Rs 16.95 lakhs	Rs 260 / tonne
Private contractors' cost	Rs 42.6 lakhs/year	Rs 14.36 lakhs	Rs 200 / tonne

Source
Guidelines for the State Finance Commissions, October 1995.

However, the safe disposal of waste in landfills or through incineration is best left to the municipality to handle on its own. This would be the responsibility of the environmental unit in the large LGs and the nagar panchayats. The costs of disposal should be met by charging a conservancy tax along with the property tax. Measures to extract value from the waste should be carried out. These could be through converting the waste into useful end products like manure/compost and biogas and sold, and also through incineration generate energy for localized supply of electricity generation or any other purpose.

Tapping the market sources of funds

Since the need for funds by the local bodies is so large, and given the pressure on funds available with the higher level governments, there is a need to leverage these with cheap funds from quasi-government bodies like the LIC and pension funds, as also from the market. The SFCs should look into the possibility of setting up state level specialized financial institutions to lend for urban infrastructure development on a commercial basis. This route is quite popular in Europe and exists in the United States too, to provide weaker municipalities access to the capital markets.

The Eighth Plan had recommended the setting up of a national infrastructure bank. This has not occurred. However, HUDCO has entered into infrastructure financing since 1989-90, and had sanctioned Rs. 1713 crore by October 1994. Besides this there are various state funds engaged in similar activities. The Municipal Urban Development Fund of Tamil Nadu (TNMUDF) is one such example which finances all types of municipal activities. The initial corpus of Rs. 100 million was given by the state government, besides which it also receives budgetary support from it and the International Development Agency (IDA). Depending on the project part of the assistance is in the form of loans and part as grant. But the TNMUDF is expected to be self sustaining with a spread of 2%. Similar funds have also been set up in Gujarat and Kerala, though the norms and conditions vary[9].

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[9] Sundaram P A S. 1996. *Resource mobilisation for urban infrastructure development in India*, National Conference on local body finance, Madras, 14-15 March, 1996.

Another option is of direct borrowing by the municipality from the market. This has been tried out by the Ahmedabad Municipal Corporation which got an AAA rating from Credit Rating and Investment Services of India Limited (CRISIL). But the poor credit image of most other municipalities and a less developed debt market in India may imply that few other LGs can follow this route. The other route is one of floating a municipal revenue bond, i.e , borrowing against the potential stream of revenues from the facilities and services which are financed through such bonds. These are not only likely to be more acceptable to the market, but would also bring focus to bear on charging appropriate prices for the services rendered and efficient collection and through these on the quality of services provided[10]. There is also the option available of involving the private sector in the provisioning of urban infrastructures and services through the build-operate-transfer (BOT) schemes.

Improving financial and managerial efficiency of the LG s

While it is apparent that additional sources for financing urban infrastructure are required, these would require to be supplemented through capacity building of the LG s for more efficient service delivery and financial management.

The present accounting system followed by the LG s leaves much to be desired. Municipal finance data is very sparse and fragmentary. There exists no standard format for presenting the accounts across states, and sometimes even within it. Records of such data are very hard to obtain as most states do not have a regular system of collection and maintenance of municipal data.

Apart from a few notable exceptions, the accounting for most LG s is done on a cash basis. This conventional governmental accounting system however, does not adequately reflect the true financial position of the LG. In the case of the services provided by it, it is difficult to link the costs of providing a service with the revenues accruing from it and thus gauge the implicit subsidy provided on the service. They do not reveal where these subsidies are coming from. There is also no transparent way of estimating the cost over-runs on a project. The accounts also do not show the outstanding dues of the LG. This is not good because it deflects attention from the important issues of recovery of dues and control on the cost over-runs and the subsidy burden borne by the LG. In many cases no distinction is made between capital and revenue expenditures. All this information is essential for proper tariff setting, and especially if debt has to be raised from the market.

It is therefore urgently required that the state finance commissions standardize the format for presentation of accounts by the LG s to make them more transparent and reflective of the actual position of the local bodies. The accounting practices of the municipal corporations of Madras and Greater Bombay are the relevant examples in this case. The former has gone in for commercial accounting and computerization of budgeting while the latter presents separate budgets for different functions.A possible approach suggested by Mehta (1995) is the fund accounting system which segregates the revenues, expenditures and assets of a service from that of the government as a whole.

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[10] Meera Mehta, Municipal Bonds For Urban Infrastructure Potential and Policy Issues, November, 1995

The budgets for each of services, viz., water supply, sanitation and sewerage, and solid waste management should be presented separately and based on commercial accounting principles . The effort should be to make each service as self-financing as possible and avoid cross-subsidization. If subsidies are inevitable, it should be made clear where they are coming from and where they are being used. Any outstanding liability or asset should clearly be accounted for. Funds from the capital account must not be diverted to meeting current revenue gaps.

In the case of large municipalities and metropolitan areas, these services could be provided by semi-autonomous public utilities with limited financial support from the local bodies. The experience in Colombia suggests that for a rapidly expanding city, a fragmented structure made up of relatively autonomous public utilities may be best as it makes them more reliant on user charges, which in turn makes the consumers more demanding and the agency more responsive to their needs There is also greater incentive for cross-subsidization across income groups and widening their reach to the poorer groups also.

There would be political compulsions not to increase tariffs, if the LGs were given the power to decide these. It may take some time for people to understand that they have to pay if they want better services, and hence initially there would be support for such a move. It is therefore necessary that the SFC prescribe a formula (but no minimum value) setting the minimum tariffs, beyond which the LG would be free to charge what it wants.

Having said that a case can be made out that what the municipalities really lack are not finances, but good management. An NIPFP study estimates that the revenue raising capacity of municipalities is at least 61% higher than what they are able to tap today. While the tariffs charged for many services are indeed low, Mehta (1995) estimates that even of this only 50 to 60 percent of charges and fees are actually recovered. The case of the Ahmedabad Municipal Corporation is a good example where a changeover to better accounting practices and recovery of old dues allowed it to recover from the red in a very short time.

Equally important as setting tariffs and improving the financial management systems, is the need to develop benchmarks for management efficiency and service effectiveness since most essential services, and especially water and sewerage, are natural monopolies. While it is essential to price services based on their costs, the lack of competition must not mean that the burden of poor operational efficiencies and management falls on the customer. Competition must actively be encouraged in the provision of other services wherever possible, like solid waste collection. As has already been mentioned in the study the cost of providing the same service is often lower for private parties than for the governmental agencies, pointing to the need for improvement in operational efficiency of the public bodies.

Increasing access to the capital markets to the LG s can potentially lead to improvements in their financial and operational management systems, yet these and an increased sensitivity to the needs of the consumer are also the pre-requisites for allowing them the same.

Suggestions/recommendations

- Urgent need to reform the property tax system to increase its yields since it is the single most important sources of tax revenues to municipalities (other than octroi).
    - Improve management through regular updating of property maps and better collection.
    - No exemptions to hospitals, schools etc., since they utilize urban infrastructures, and hence must pay for it.
    - Preferable to move to area-based taxation since it seems to lead to better yields, and also creates incentives for better land utilization.
- Profession taxes, advertisement and entertainment taxes satisfy the congruence principle and should be assigned to the municipalities.
- Depending on the position of state finances and the requirement of the local bodies, the SFCs should set aside a certain portion of the global pool of state revenues for distribution to the local bodies.
    - These should be distributed in a transparent and predictable manner to allow the local bodies to plan in a longer time horizon.

    The following criteria should be used to allocate funds between them:
    - Population.
    - "Distance" between the per capita incomes in the richest municipality and the given one.
    - "Distance" between an appropriately devised index of urban infrastructures for a municipality and the best one in a similar category.
    - Tax effort determined taking into account an appropriate indicator of tax potential.
- Penalties and fees collected from polluting agencies collected through the SPCBs, along with other central and other funds for similar purposes should be distributed to municipalities for carrying out environmental improvement programmes.

- Infrastructure improvements in built-up areas can be financed through levying valorification or betterment charges on the affected property owners in proportion to their imputed benefits.
    - Capital costs for providing these to newly developed areas can be recovered through levying development charges.
- User charges should be used to recover supply costs wherever possible. It is difficult to justify subsidies in the supply of basic services, since they may be regressive with respect to income. On the whole, they promote inefficient delivery and wastage
- Water supply and sewerage
    - The capital cost of water supply should be mainly financed through connection charges, and additionally through borrowing or from internal resources. An annual water tax, assessed on the basis of property values should be levied to create a capital fund for meeting future needs
    - Tariffs should be set such that operating revenues are enough to meet operating and maintenance costs, and interest payments on debt.
    - Every connection should be given a minimum lifeline supply at no cost, while the tariff should be progressively increased for higher consumption blocks to minimize wastage of the precious resource.
    - Access of the poor could be encouraged through allowing them to pay their connection charges in installments. These could be collected along with the monthly bill.
    - In the case of slums where house connections are not given, the area residents' committee or any other representative body should collect at least a minimum percentage of the connection charges specified, with the rest being provided by the municipality. This body should also be accountable to pay a yearly charge for water supply.
    - for sewerage facilities other than the connection charge, user charges should be collected as a surcharge on the water bill.
- The formula for determining the minimum tariff should be set by the state finance commissions, but the actual rate should be left to the local body to decide.
- In many cases SW collection can successfully be farmed out to the private sector, though proper waste disposal remains a responsibility of the municipality. The costs of this should be met by charging a conservancy tax along with the property tax.
- Budgets for water supply, sanitation and sewerage and solid waste management should be presented separately. Effort should be to make each as self-financing as possible and cross-subsidization avoided.

- In the case of large metropolitan areas it may be best to provide these services through semi-autonomous public utilities with limited support from the local body.
- The option of privatization needs to be explored. Many services can be provided more efficiently and cheaply by private sources.
- The need to leverage public funds through setting up specialized financial institutions for lending for urban infrastructure development should be assessed by the SFCs.
- However accessing commercial sources of funds for financing urban infrastructure would require moving from the usual cash accounting system of the government to a system based on commercial accounting principles which reveal the true financial position of the LG or the utility.
- There are tremendous gains to be made from improving the financial management and operational efficiency of the utilities and the LG. While setting the tariff care must be taken that the customer does not have to bear the cost of these, especially since most of these basic services are natural monopolies.

CHAPTER 6

Legal aspects

Introduction

The legal framework of the country is old, but comprehensive in terms of its coverage. Although there maybe several loopholes in the laws which is an issue in itself, the problem has always been more of implementation/enforcement. Also, it is not as if there are too few laws; in fact, there are a plithoria of laws which look at the environment, urban planning, and the supply of basic services. These could be in the form of central enactments, state legislatures and/or the municipal acts. Each level of government has a legal framework to work within - as do the municipalities.

The Constitution of India specifies the functions and authority of local governments in the 74th Amendment, which apart from giving constitutional recognition to the LGs which implies, among other things, that they should be an elected body as representatives of the people. Also with this Amendment, the functional areas of the municipalities has increased It is popularly felt that adequate financial and legal backing for them is lacking to undertake the set of assigned functions, let alone that for the new ones. But, a little innovation in the present tax structure and possible sources to raise revenues (as suggested in the previous chapter) exist; and also the appropriate interpretation of the relevant laws could be effectively used as they exist or with a few possible amendments.

Environmental regulations such as the Air Act, Water Act, Environmental Protection Act, Conservation Act, Dangerous and Offensive Trade Act, siting regulations, Coastal Zone Regulation, Factories Act, etc.; urban land use regulations such as the Urban Ceilings Act, Town and Country Planning regulation, etc.; and other acts like the Criminal Act, Penal Code, etc. all play a significant role in the protection of the environment. This chapter gives an overview of these regulations and suggests possible inclusions/amendments that could be made to make them more effective. But it needs to be kept in mind that these suggestions will have little value without the proper institutional mechanism that will implement and enforce the laws.

Constitutional provisions

Apart from the then West Germany and Japan, where LG level constitutional recognition was somewhat forced by Allied Powers after the World War II, in recent times, Brazil and Nigeria have accorded constitutional recognition to their LG. The Indian Constitution gave recognition to the *panchayati raj* bodies (LGs at the village level) as was suggested by the

Ashok Mehta Committee in 1978, to accord requisite status to rural LGs as well as an assurance of their continuous functioning.

The coverage of the LG in the 7th Schedule of the Constitution is as follows - "local government, that is to say, the Constitution and powers of municipal corporations, improvement trusts, district boards, mining settlement authorities and other local authorities for the purpose of local self government and village administration"[1]. The Constitution shows a progressive decentralization towards the local bodies. The 74th Nagarapalika Act of 1993, is another important step toward this process. It divests more powers to the LGs and enlarges the functional sphere of the municipalities by adding new responsibilities such as planning for economic and social development, urban forestry, protection of environment and promotion of ecological aspects; slum improvement and upgradation, and urban poverty alleviation.

The Directive Principles of State Policy of the Indian Constitution, provides in clear and unambiguous terms, the State's commitment to protect the environment. Article 48(A) of the Directive Principles states, "the State shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country".

Environmental protection is also enshrined as a Fundamental Duty of the Citizen of India. Article 51-A(g) mentions that it shall be the duty of every citizen of India "to protect and improve the natural environment, including, forests, lakes, rivers and wildlife, and to have compassion for living creatures". The 73rd Amendment Act of 1992 on *panchayats* which adds a 11th Schedule to the Constitution has eight entries (viz. 2, 3, 6, 7, 11, 12, 15 and 29) which are linked to environmental protection and conservation. The functions assigned to *panchayats* include soil conservation, water management, watershed development, social and farm forestry, drinking water, fuel and fodder, non-conventional energy sources and maintenance of community assets which are significant from the environmental management point of view. Entry 8 of the 12th Schedule added to the Constitution by the 74th Amendment Act, 1992 for constitution of urban local bodies assigns the function of "protection of environment and promotion of ecological aspects". Other functions on provision of basic services remain more or less the same.

These Constitutional provisions have been given effect through the "regulatory" environmental protection laws in India exemplified in the umbrella Environment Protection Act, passed in 1986, and the more specific Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 to specifically regulate the problem of air and water pollution Among the specific natural resources protection acts are the Forest (Conservation) Act, 1980 and Wildlife (Prevention) Act, 1972 extended to cover Biosphere Resources and the Hazardous Wastes (Management and Handling) Rules, 1989,

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[1] "Constitutional Status of Local Government in India", Abhijit Datta. First Course on Laws in Municipal Administration, November 9-13, 1987. IIPA.

Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, Manufacture, Use, Import, Export and Storage of Hazardous Micro-Organisms and Genetically Engineered Organism or Cell Rules, 1989 to regulate storage, use, trade, transport and disposal of hazardous wastes.

The GOI introduced an urban legislation called the Urban Land (Ceiling and Regulation) Act in 1976 with the objective of preventing the concentration of urban lands in the hands of a few persons and ensuring its equitable distribution. This Act is applicable to selected urban settlements. However, it has created many problems for proper physical planning and development due to its operational deficiencies.

Some of the regulations relevant to the context of the urban environment are discussed briefly below.

Town planning legislation

The earliest town planning legislation in India was enacted by the Government of Bombay in the year 1915 which was followed by other provinces, that is, United Provinces (1919), Madras (1920) and Punjab (1922). These enactments only provided for undertaking town improvement schemes and they did not intend nor did they provide for comprehensive planning which has now come to be accepted as a necessity for directing and regulating urban and regional development.

The Urban Land (Ceiling & Regulation) Act, 1976

The basic objectives of this Act was to (I) prevent the monopolistic ownership of land by only a few persons which brings about a more equitable distribution of existing large urban holdings; (ii) devote the land in excess of the ceiling for public purpose; (iii) check speculation and profiteering in urban land; and (iv) to mop-up the unearned profit for the benefit of the community. Although, this Act was socialistic, it ran into several problems, and faced constant litigations.

The Act provides for:

- Imposition of a ceiling on vacant land, on a grade scale, on the basis of the size of the city.
- Acquisition of the excess vacant land by the LG, with powers to dispose off the vacant land to subserve the common good.
- Granting exemptions in respect of certain specific categories of vacant land.
- Regulating the transfer of vacant land within the ceiling limit.
- Regulating the transfer of urban or urbanisable land with any building for a period of ten years.

- Restricting the plinth area for the construction of future residential buildings.
- Payment of an amount in cash or in bonds for the acquisition of the excess vacant land.

There is a need to amend this Act in the context of the 74th Amendment. There has been recent debate on scrapping the Act altogether.

Municipal Acts

As part of the Municipal Acts (MAs) the view toward a better urban environment stems primarily from the angle of public health and sanitation in relation to water. The MAs envisage *a clean and healthy environment* for the inhabitants to live with by laying sufficient emphasis on preservation of public health. Municipal enactments invariably contain provisions dealing with public health and sanitation (Chapter XVII of the DMC Act, 1957). They enjoin the municipal bodies to provide wholesome water to the inhabitants and have proper arrangements for effectual drainage and sewage disposal (Section 240).

The Delhi Municipal Corporation Act (DMCA) further provides that "on and after such date as may be appointed by the Central Government, in this behalf, no sewage shall be discharged into any water course until it has been so treated as not to affect prejudicially the purity and quality of water into which it is being discharged (Provision to Section 250 and Section 241 also).

There are some obligatory functions imposed by the statute on the municipal bodies for the preservation of public health. The MAs do not provide adequate incentives to the polluters to clean up, they contain provisions to deal with individual polluters. In the MA, "pollution" is not even defined.

Some of the oldest MAs are those of Gujarat, Bombay, Delhi and Madras. The environmentally relevant portions have been extracted herewith.

Gujarat Municipal Act, 1963

The Act defines "nuisances" to include any act, omission place or thing which causes or is likely to cause injury, danger, annoyance or offence to the sense of sight, smelling or hearing or which may be injurious to health or property {Section 2(5)}. Under the provisions:

- The depositing of rubbish, filth, etc. or committing any nuisance in any street, drain or on the banks of any river, water course, etc. or any public place other than where it is permitted to be deposited under the Act is prohibited (Section 192).
- The committing of nuisance in any sewer, drain or water course or in such close proximity thereto as to pollute the same is prohibited (Section 192).
- The discharging of sewage, etc. from any building or land to any street or open space etc. so that it is likely to be offensive or to remain stagnant is prohibited (Section 193).

- Keeping any dirt, filth or nightsoil or any other noxious or offensive matter in any land or building by the owner/ occupier is prohibited.
- Removal of any nightsoil or other such offensive matter other than during the permitted hours is prohibited.
- Washing of cloths by washer man except at places appointed by the municipal body is prohibited.
- Fouling of water by bathing in streams, etc. is prohibited.
- Use of nightsoil or other manure or substance emitting offensive smell is prohibited

Section 206 of the Act empowers the municipality to deal with smoke nuisance, which results in air pollution. This Section empowers them to direct by public notice that any furnace employed in any works or buildings for the purpose of any trade or manufacture, "to be constructed, supplemented or altered so as to consume or burn or reduce as far as may be practicable, the smoke arising from such furnace". This Section read with Section 221 gives sufficient powers to prevent pollution of air by certain industries

Calcutta Municipal Act, 1951

There are several comparable sections in the Act that cover the protection of public health. In addition Section 436 of the CMA empowers the commissioner to refuse to give permission if (s)he is of the opinion that the establishment of such factory etc. would be objectionable by reason of the density of the population in the neighbourhood or to the inhabitants. Section 437(I)(b) disallows the use of premises in case of nuisance.

Delhi Municipal Corporation Act, 1957

In addition to the above provisions of the MA, the DMC can make by-laws regarding elimination of trade effluent, before it enters the municipal drain, the permitted quantity, rate of discharge, the temperature of trade effluent to be discharged, etc.

None of the MAs provide that the municipalities should conduct the pre-treatment of municipal waste and industrial effluents before they are discharged into municipal drains. The MAs give very little emphasis on land use planning, involvement of the ward committees and resident associations, external experts in decision-making, environmental impact assessments of development projects, and public participation and hearings. These are important aspects that need to be included in amendments of the MAs.

The Nagarapalika Act

This was the basic act that provided for the devolution of powers to the urban local governments. The Act which was Gazetted in April 1993 has the following main features:

- The number of different types of municipal are clearly defined.
- The state government cannot suspend or supersede municipal governments. Dissolution of municipal governments can be carried out only after giving them a fair hearing. No period of dissolution can last more than six months without fresh elections being held.
- To provide citizens with easy access to municipal government, any municipality with a population of over three lakhs shall be broken up into territorial constituencies known as wards, and ward committees shall be formed consisting of one or more wards.
- Powers are granted to local government to carry out urban planning land use regulation, and implementation of schemes for poverty alleviation, environmental protection, slum improvement, economic and social development, etc.
- One-third of all seats in municipal government shall be reserved for women.
- Reservation of seats in municipal government for scheduled casts/ scheduled tribes and other backward communities shall be at least in proportion to their presence in the local population.
- A State Finance Commission, along the lines of the Central Finance Commission, shall be constituted to make recommendations for the sharing of funds between state and local governments.
- A State Election Commission, along the lines of the Central Election Commission, shall be constituted to oversee elections of local governments.
- Planning committees to prepare integrated development plans shall be formed at the District and metropolitan levels.

The Constitutional Amendment only gave broad guidelines and it was left to the individual states to formulate detailed legislation. All the states were given a deadline of June 1st 1994 by which they needed to restructure their existing laws to remove any provisions which were in violation of the amendment.

Many of the states have not yet made the required amendments in their MAs. Further it is felt that the large metropolitan areas should have the their own Finance Commissions since they are large and should be in a position to decide on their own revenue raising system. Also, they should be given the constitutional authority to monitor the environment and develop programmes that are presently carried out by the state environment agencies.

The 74th (Constitutional) Amendment Act, 1992

The main objectives of this Act are:

- To provide constitutional status to institutions of local self government.

- To decentralize the decision making powers of the political process to achieve participative democracy and decentralized planning process.
- To establish uniformity in governance of municipal bodies throughout the country.
- To ensure regular elections to municipal bodies.
- To improve the financial position of these bodies.
- To ensure adequate representation to the weaker sections of society.

It recognizes three levels of governments-

- *Nagar panchayats* - areas under rural to urban transition.
- Municipal councils - smaller urban areas
- Municipal corporations - larger urban areas.

The functions of the local government will undertake functions as described under the 12th Schedule which includes the following:

- Urban planning including town planning.
- Regulation of land use and construction of buildings.
- Planning for socio-economic development
- Roads and bridges.
- Water supply for domestic industrial and commercial purposes.
- Public health, sanitation conservancy and solid waste management.
- Fire services.
- Urban forestry, protection of the environment and promotion of ecological aspects.
- Safeguarding the interests of the weaker sections of the society (including the physically and mentally handicapped).
- Slum improvement.
- Urban poverty alleviation.
- Provision of urban amenities and facilities such as parks, gardens, playgrounds.
- Promotion of cultural, educational and aesthetic aspects.
- Burials and burial grounds.
- Cattle pounds; prevention of cruelty to animals.
- Vital statistics including registration to animals.
- Vital statistics including registration of deaths and births.
- Public amenities including street lighting, parking lots, bus stops and public conveniences.
- Regulation of slaughter houses and tanneries.

It is the general feeling that these Constitutional amendments have ignored to a large extent the financial powers of the bodies, since they are still decided by the state government.

There is no Constitutional guarantee provided to the municipalities to raise their own revenues, but there is also no "objection" in it which disallows the municipalities to raise their own revenue. From the 12th Schedule although the functional areas are specified, the specific municipal functions under the 74th Amendment are not described. There are also basic omissions in the 12th Schedule functions relating to human development - primary and secondary education, basic health care. The functions in the Schedule remain concurrent with that of the State functions. Therefore there is an urgent need to specify exclusive functional list and define the time span for the devolution of the functional aspects.

The District and Metropolitan Planning Committee is proposed to be constituted to consolidate the plans prepared by the *panchayats* and municipalities in the district and to prepare the overall District Plan. The need for spatial planning is highlighted only in the context of integrating matters of common interest between the *panchayats* and the municipalities. Sharing of water, natural resources, provision of infrastructure, conservation of environment are also sighted as examples needing integrated development. There would be a separate committee for planning the development of the metropolitan area.

The need to involve experts from different disciplines in the planning process has been omitted. Also, there is a need to further decentralize environmental activities in the large cities (municipal corporations and councils) as mentioned in Chapter 4 on Organizational Aspects. Functions of the district and metropolitan committees should be specified in the Amendment.

Environmental regulations

The establishment of a diversified industrial structure, based on a combination of heavy and small-scale industries and the growing urban and rural population in India has resulted in the deterioration of air, water and land and forest resources. To mitigate resource degradation and ensure its protection in future several regulations have been passed starting with the Water (Prevention and Control of Pollution) Act, 1974. Following this the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Coastal Zone Regulation, the Hazardous Wastes Act, etc were passed. All these regulations apply to the urban areas as well. They are detailed below

Air Pollution (Prevention) Act, 1981

The Air (Prevention and Control of Pollution) Act, 1981 provides for the prevention, control and abatement of air pollution. The Act defines "air pollutant" to mean any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment. Excerpts of the Act are given in Box 1.

In the urban environmental context, the use of the Air Act will be of prime importance. Today, the SPCBs conduct regular ambient air quality monitoring at specific areas with each city/town. It is suggested that the metropolitan areas have their own separate monitoring programme identified and planned by the environmental unit (as suggested in Chapter 4). The large municipalities should be given the powers (under the MAs) to prosecute offenders of this Act. Functions such as education/awareness, inspection and monitoring, etc. should be in the ambit of the municipalities, and those requiring technical inputs such as of standard setting, should remain with the state boards. Further, the District and Metropolitan Planning Committees, conduct the monitoring all the other areas, which will help them in the preparation of the draft development plan (a function assigned to them in the 74th Amendment). The penalty under this Act should be sufficiently high to ensure compliance. The Motor Vehicles Act should get integrated into the Air Act.

Box 1

Air Pollution (Prevention) Act, 1981.

An Act to provide for the prevention, control and abatement of air pollution, for the establishment, with a view to carry out the aforesaid purposes of the Board, for conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith.

Chapter I of the Act gives the basic definitions related to air pollution, control/abatement.; Chapter II specifies the constitution of the State and Central Pollution Control Boards (S/CPCBs); and, Chapter III, lists the functions and powers of the Boards The functions and powers of these Boards include

Central functions
* Improvement of air quality, prevention, control/abatement of air pollution in the country.
* Advise central government on any matter concerning the improvement of air quality
* Plans on nation-wide air pollution control/abatement programmes
* Coordinate activities and provide technical assistance with the SPCBs.
* Training, education, and popular publications.
* Setting of standards.

Central powers
* The CPCBs function under the direction of the central government
* Functions of the SPCBs is decided by direction of the CPCBs.

State functions

In addition to similar function as that of the CPCB but at the state level, the SPCBs
* Inspect control equipment in industries.
* Inspect air pollution control areas periodically
* Standard setting and develop siting guidelines

State powers
* To declare any area as air pollution control areas for the purposes of the Act.
* To permit the establishment or operation of any industrial activity in an air pollution control area.
* Inquire into any plant on the application of consent to operate in the area
* To ensure the functioning of the plants within the stipulations (control equipment specifications, efficiency of operating these equipment, etc) set by the SPCBs

Penalties

Non-compliance would be penalized with imprisonment for a term which shall not be less than one-and-a-half years, but which may extend to six years and with a fine. In case the failure continues, an additional fine of five thousand rupees for every day during which the failure continues after the conviction for the first such failure If the failure extends beyond this for a period of one year after the date of conviction, the offender shall be punishable with imprisonment for a term which is not less than two years but may extend to seven years with a fine.

Source: Bakshi P M. 1993. *The Air (Prevention and Control of Pollution) Act, 1981.* Indian Law Institute, New Delhi

Water Pollution (Prevention) Act, 1974

This Act is the first Act passed in the country relating to pollution. Its object is to provide for the prevention and control of water pollution and the maintenance or restoration of wholesomeness of water, for the establishment (for the above purpose) of Boards, for the conferment of powers and functions on the Boards for the above purpose and for connected matters. An abstract of the Act is given in Box 2.

Water quality is of very local relevance, even in the case where water is shared between two or more municipalities. Firstly, the Act should confer powers to the municipalities to prosecute under the Act; secondly, the "polluting municipality" should clean up and/or pay for the possible damage caused as a result of its pollution on other areas (municipalities); and thirdly, there should the clause for treatment of water in the Act. Penalties should be increased drastically. The responsibilities of the District and Metropolitan Planning Committees should be specified in the Act.

Water (Prevention and Control of Pollution) Cess Rules, 1978

These Rules specify the rates of water usage, how the cess should be collected and by whom, and who is liable to pay the cess on water. It requires every water consumer to affix a water meter (ISI specified) at the entrance of the water supply connections. Monthly consumption is recorded. The cess collected by the state government is remitted to the central. The prescribed rate of water cess is given in Table 6.1. These are presently under revision.

It is felt that the rates are too low and allow of the indiscriminate use of water. Also, the difference in the rate payable by the various consumers is negligible. Since water use is localized and puts stress on the local water resource base, the cess should be collected by the municipalities rather than the state to the center. This will also ensure the effective and rational use of water and become an additional revenue for the municipalities.

Table 6.1. Prescribed rate of water cess

Purpose of water use	*Rate of cess under Sub-section(2) of Section 3 (paise./kl)*	**Rate of cess under Sub-section (2A) of Section 3 (paise/kl)*
Industrial cooling, spraying in mine pits or boiler feeds	1.50	2.25
Domestic purpose	2.00	3.00
Processing whereby water gets polluted and the pollutants are easily biodegradable	4.00	7.50
Processing whereby water gets polluted and the pollutants are easily biodegradable and are toxic	5.00	9.50

Note

* These rates shall be applicable only in the case of non-compliance with any of the prescribed consent conditions or any of the standards for discharge of effluents prescribed by the Central Government under the EPA, 1989, otherwise, as specified under column (2).

Source

Bharat Desai. 1995. *Environmental Laws in India*. Annexure VI. p. 89.

Coastal Regulation Zone Notification, 1991

Box 2

Water (Prevention & Control of Pollution Act, 1974.

The Act applies to specified States and Union Territories. It uses water pollution to mean " such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals/plants/aquatic plants or organisms "

Functions & powers: The powers and functions of the Central and State Boards, follow very similar to that listed to in the Air Act, 1981.

Penalties: Non-compliance is punishable with imprisonment for a term which may extend to three months or with fine which may extend to five thousand rupees or with both and in the case the failure continues, with an additional fine which may extend to one thousand rupees for every day during which such failure continues after the conviction for the first such failure.

Source: Bakshi P M. 1993. *The Water (Prevention & Control of Pollution) Act, 1974.* The Indian Law Institute.

This Notification {S.O.114(E)} passed on the 19th February, 1991, comes under Section 3(1) and Section 3(2)(v) of the Environment Protection Act (EPA), 1986 and rule 5(3)(d) of the Environment (Protection) Rules, 1986, declaring coastal stretches as Coastal Regulation Zone (CRZ) and regulating activities in the CRZ. The EPA, 1986, declares the coastal stretches of seas, bays, estuaries, creeks, rivers and backwaters which are influenced by tidal action (in the landward side) up to 500 meters from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) and the HTL as coastal regulation zone. It imposes restrictions of the setting up and expansion of industry, operations or processes etc. in the CRZ. For purposes of this Notification, the HTL will be defined as the line up to which the highest high tide reaches during spring tides. The Notification states that the distance from the HTL to which the proposed regulations will apply in the case of rivers, creeks, and backwaters may be modified on a case basis for reasons to be recorded while preparing the CZ Management Plans. However, this distance will not be less than 100 meters or the width of the creek, river or backwater, whichever is less. Details of permissible and prohibited activities in the CRZ are given in Box 3.

Box 3

Prohibited activities under the CRZ Notification, 1991

- Setting up of new industries & expansion of existing industries, except those directly related to the water front or directly needing foreshore facilities.
- Manufacture or handling or storage or disposal of hazardous substances as specified in Notifications S O 594(E), 28th July 1989, S O.966(E), 27th November 1989, and G S R 1037(E), 5th December 1989
- Setting up /expansion of fish processing units, warehousing, etc
- Disposal of wastes, effluents except facilities for the treatment & discharge of effluents approved under the Water Act, 1974
- Discharge of untreated wastes & effluents from industries, cities and towns and other human settlements Schemes shall be implemented by the concerned authorities for phasing out the existing practices, if any, within a reasonable period of time, not exceeding 3 years from the date of this Notification
- Dumping of city & town waste for the purpose of landfill, etc , and ash disposal from thermal power plants will not be allowed
- Land reclamation, bunding or disturbing the natural course of sea water, etc , is not permissible
- Mining of lands, rocks, etc., except of rare minerals that is not available outside the CRZ
- Harvesting or withdrawal of ground waters within 200m of the HTL and in the 200m or 500m zones Allowed only when done manually (ordinary wells) for drinking, horticulture, agriculture & fisheries
- Construction activities in ecologically sensitive areas, and between the LTL and HTL

Source: Bharat Desai 1995. Environmental Laws of India p 20

This Act is very comprehensive. Since it is again under the State Legislature, it is suggested that it be brought under the MAs. In most coastal areas indiscriminate dumping of solid wastes, disposal of untreated sewage and the withdrawal of large quantities of water for commercial (such as tourism) purposes is taking place. Most of the important coastal areas also have large populations and are governed by large municipalities. Here again, the LG should be made responsible for ensuring that the prohibited activities under the CRZ Act do not come up. Further, since disposal of solid wastes and sewage and treatment presently is the responsibility of the municipality, non-compliance by them should be made punishable under the EPA. This will bring in accountability of the municipalities and also encourage them to find alternatives to the problem, through private participation and R&D.

Environment (Protection) Act, 1986

This is an umbrella legislation for the protection of the environment. Several sets of Rules relating to various aspects of management of hazardous chemicals, wastes, micro-organisms etc. have been notified under this act. Emissions and effluent standards with respect to 61 categories of industries have been evolved and notified under this act. The Act also includes an annual environmental audit.

S.O.60(E) Whereas a notification under clause (a) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986 inviting objections from the public within sixty days from the date of publication of the said notification, against the intention of the Central Government to impose restrictions and prohibitions on the expansion and modernization of any activity or new projects being undertaken in any part of India unless environmental clearance has been accorded by the Central Government or the State Government in accordance with the procedure specified in the notification S.O.No.80(E) dated 28th January, 1993

The Forest (Conservation) Act, 1980

This Act provides for the conservation of forests. It requires the preservation of a reserved forest area; that no portion of forest land to be used for non-forest purposes; that no forest land may be assigned by way of lease to anyone without authorization; and that any part of the forest land may be cleared without permission.

Urbanization has in many areas cut into forest areas. With this forests have been denuded for commercial logging and firewood. The preservation of these land, through land use planning and strategic planning of the growing urban areas, would reduce the stress on the resource. The municipalities have under their jurisdiction the fringe areas (that could also be forest areas in some cases), which they have the ability to protect through proper and farsighted planning.

The Land Acquisition Act, 1894:

The Central act is the main legal tool which gives pre-emption rights to public authorities in India to acquire, develop and allot land for public purpose. This Act is nearly a hundred years old and obsolete.

Indian Factories Act, 1948

This Act has stray provisions for preventing pollution. The Act requires factories to make effective arrangements for the disposal of wastes and effluents and empowers State Government to make rules regarding the same.

Public Liability Insurance Act, 1991:

This is the most important legislative measure enacted in India on the subject of hazardous substances. The very substantive section of the Act (Section 3) incorporates the principle of liability without fault and imposes on the "owner" liability to give relief in respect of death or injury to any person or damage to any property, resulting from an accident occurring while handling any hazardous substance The details of the Act are given in Box 4.

These legislation have helped urban planning and development to systematize the process and actions on different aspects, however, in the context of contemporary development planning, they are to be reviewed periodically to make them subserve the planning process. The Penal Code and the Criminal Acts could also be effectively used by the municipalities to protect the urban environment

Box 4

Public Liability Insurance Act, 1991

The objective of the Act is to provide public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances. It requires every owner to bring out an insurance policy

Any person authorized by the Central Government, shall have the right to enter the premises to determine where the hazardous substance is handled and disposed, etc

Penalty. Non-compliance is punishable with imprisonment for a term of one-and-a half years, extendable to six years, or with fine which shall not be less than one lakh rupees, or both On the second offense the penalty will be imprisonment unto two years extendable to seven years and a fine of one lakh rupees

Schedule: (a) Reimbursement of medical expenses incurred up to a maximum of RS 12.500 in each case. (b) for fatal accidents the relief will be RS, 25,000 per person in addition to (a); © for permanent total or permanent partial disability or any other injury or sickness, the relief will be (a) and cash relief on the basis of percentage of disablement as certified by the physician. Here the relief would be RS. 25,000, (d) for loss of wages due to temporary partial disability, there will be a fixed monthly relief not exceeding RS. 1,000 per month up to a maximum of three months, and (d) unto RS 6,000 depending on the actual damage, for any damage on private property.

Source Bakshi P M 1993 The Public Liability Insurance Act, 1991. The Indian Law Institute, New Delhi

Fiscal Incentives for Pollution Control

The foregoing discussion was largely confined to what are called 'command and control' type regulatory measures. The policy enforcement regime lays down a specific quantitative restriction to which all polluters must conform. Those who fall to comply are punished. This kind of regulation uniformly restricts the set of choices available to all polluters, regardless of differences in either their preferences or their opportunity costs of compliance. It is therefore a somewhat blunt and inefficient ambient standards could in principle be achieved through a system of economic incentives which internalize the externalities of pollution. With all polluters equalising their opportunity costs at the margin, given standards could be achieved at lower social cost than the 'command and control' system. More generally, society could also equalise benefits and costs at the margin and arrive at a socially optimal combination of pollution and economic or other activities which are in themselves desirable but have the undesired effect of causing pollution[2].

Here we shall review the few economic incentives which have so far been introduced for pollution abatement in India, not as an alternative to regulation but only as supplementary measures. Notice that an incentive system is also at work in the regulation regime since punishments, including monetary fines, are used as inducements to ensure compliance. However, it will be obvious that an 'inducement' like imprisonment for violating a law is qualitatively quite different from fiscal incentives like the taxes, subsidies or charges described below.

Accelerated Depreciation for Corporate Tax Computation

The Income Tax Act of 1961 allows the deduction of a certain percentage of the written down actual cost of capital assets, net of any subsidies and concessions, from gross profit in computing the base for levy of Corporation Tax. The rates allowed for such depreciation vary from one asset to another. A notification issued in February 1983 introduced for the first time a higher rate of depreciation for pollution control equipment (Table 1.4) at 30 per cent of written down actual cost as compared to the usual rate of 25 per cent applicable for general plant and machinery This was raised to 50 per cent in the 1987-88 budget, reduced to 40 per cent in 1992-93 and finally raised to 100 per cent in the budget for 1993-94

Investment Allowance for Corporate Tax Computation

From April 1976 to March 1987 a provision was available in the Income Tax Act under which a company could deduct up to 25 per cent of the actual cost of some specified new assets, subject to certain conditions, for computation of taxable profit. In the case of pollution control equipment this allowance was raised to 35 per cent from 1983-84 A modified scheme was introduced in 1987-88 called the Investment Deposit Account Scheme. However, this also has been discontinued since March 1991

Other Direct Tax Incentives

A provision introduced in 1982 under section 35CCB of the Income Tax Act allows deduction of contributions made by taxpayers to any Institution for programme of conservation of natural resources in computing taxable income. Another direct tax provision also relevant for pollution control is the exemption of capital gains arising from transfer of building, land, machinery, etc , for establishing business in a new place and thereby reducing industrial congestion.

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[2] Mehta S, Mundle S, Shankar U 1993. **Incentives and regulation for pollution abatement with an application to waste water treatment** NIPFP, New Delhi

Rebate on Customs or Excise Duties and Sales Tax

Under the Customs Tariff Act imported goods are subject to a basic and auxiliary duty plus a countervailing duty to match the corresponding excise duty on domestically produced goods In march 1989 the basic duty was reduced to a concessional rate of 35 per cent for some specified pollution control equipment. The countervailing duty was also eliminated for such items. In March 1992 the auxiliary duty was also reduced to 5 per cent.

Domestically produced goods are subject to excise duties under the Central Excise and Salt Act of 1944. Since March 1992 a rebate has been allowed on excise duty over 5 per cent for specified pollution control equipment. In order to avail of these rebates in customs and excise duties applicants have to acquire a certificate that the equipment is being used for controlling pollution. The certificate has to be issued by an officer not below the rank of deputy secretary in the Ministry of Environment and Forests.

In addition to the rebates on customs and excise duties levied by the Central Government, rebates on states sales taxes have also been introduced by a number of states for specified pollution control equipment.

Suggested amendments/inclusions

Constitutional

- The 74th Constitutional Amendment has given recognition to the urban local bodies, it should be amended further to give them:
    - Constitutional rights to decide on ways to raise their own revenue.
    - Introduce a finance commission for the large metropolises and municipalities (on similar lines of the State and Central Finance Commissions).
    - It should clearly spell out the functions (and not just the functional areas) of the municipal corporations, councils and *nagar panchayats*.
- A newly added Part XI-A to the Constitution has laid down important provisions for the first time introducing spatial and environmental planning in the planning system at various levels right from nagar panchayats to metropolitan regions and then integrating the municipal plans with district plans and through them with the state and national plans[3]. The environmental functions of the district and metropolitan planning committees should be defined.
- Sub-section 2 of Article 243-Q has listed the parameters for classifying the urban local bodies into the three categories *nargar panchayats*, municipal councils and municipal

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[3] Center for Rural Development and School of Planning and Architecture, New Delhi. National Workshop on *Implications of the 73rd and 74th Constitutional Amendment Acts on District Planning and Development*. 19-20 January, 1995 p 63-70

corporation. The application of these parameters for classification of urban local bodies is left to the state government. Also the criteria for categorizing urban areas into these three categories should be made clear.

- The existing Municipal Acts by and large have exhaustive lists of obligatory and discretionary municipal functions which do not include town planning, socio-economic planning and development control (this is probably since these are derived from the State Town Planning Acts). The above aspects should form a part of the obligatory function of the municipal bodies.
- The 74th Amendment does not make any distinction between obligatory and discretionary functions of the municipalities, whereas the MAs do. This needs to be changed.
- The 74th Amendment leaves the composition of the municipality to the state government. This should be amended to include experts from various fields playing advisory roles, as it should for the District and Metropolitan Planning Committees.
- The Ward Committees envisaged in the Article 243-S has left the state government to make provision for the composition and territorial area of a ward committee. The functions of these committees have not been defined. The Article should be amended to give the municipalities the authority to decide on the functions of the ward committees.
- Article 243-ZB of the Amendment provides for the constitution of a committee in every state at the district level to consolidate the plans prepared by the municipalities and prepare the draft development plans for the district. The composition of these committees are again decided by the state governments. The detail functions of these bodies should be listed.
- There are also basic omissions in the 12th Schedule functions relating to human development - primary and secondary education, basic health care.
- The functions in the Schedule remain concurrent with that of the State functions Therefore there is an urgent need to specify exclusive functional list and define the time span for the devolution of the functional aspects.

Municipal Acts (MAs)

- In the MAs, there should the provision to follow the EPA, 1986.
- All the MAs in the country should be amended to include the 74th Amendment which should have been done by 1994
- The MAs should be amended to include the formation of the Environmental Unit and thereby define the functions and interactions with the state environmental institutions.

- The MAs should be amended to include the authority of the municipalities in defining the functions of the ward committees.
- There should be the specific provisions in Acts to allow the municipalities to decide on financing mechanisms for environmental protection and infrastructure development.
- The Acts should make it an obligatory function of the municipalities to conduct public consultations for major development projects.
- The MAs should include that the municipalities conduct the pre-treatment of municipal waste and industrial effluents before they are discharged into municipal drains.
- The MAs give very little emphasis on land use planning, involvement of the ward committees and resident associations, external experts in decision-making, environmental impact assessments of development projects, and public participation and hearings.

Environmental Acts

- The EPA, 1986, should be amended to include the role of the municipal bodies in the protection of the urban environment
- The EPA should also be amended to include the roles of the environmental cell, District and the Metropolitan Planning Committees and the coordination of these bodies with the state environmental departments.
- The penalty specified in the EPA should be as prescribed therewith and not as per the Air and Water Acts. This clause in the EPA nullifies the purpose of greater penalty to the polluter.
- The Air and Water Acts should be modified to include the responsibility of the municipalities in the protection of these resources. The large municipalities should be given the powers (under the MAs) to prosecute offenders of these Acts The "polluting municipality" should clean up and/or pay for the possible damage caused as a result of its pollution on other areas (municipalities); and thirdly, there should the clause for treatment of water in the Act. Penalties should be increased drastically The responsibilities of the District and Metropolitan Planning Committees should be specified in the Act.
- Since the disposal of solid wastes and sewage and treatment presently is the responsibility of the municipality, non-compliance by them should be made punishable under the EPA and in coastal areas under the CRZ Notification.
- The Forest Conservation Act and the Public Liability Insurance Act should be bought under the ambit of the municipalities.

CHAPTER 7

Environmental management options

Introduction

Apart from providing the municipalities with the legal, financial and organizational framework to undertake the large and important task set out in the Local Agenda 21 (and also the 74th Amendment), there is also a need to provide them with tools, methodologies and techniques. These will help them sustain, develop and improve their planning process, to make service provisioning more effective. The basic management options that exist at the central and the state level, should also be there for the municipalities to use, and in addition those that will be more useful at the local level need to be applied here.

Short term decisions must be taken within the framework of long term strategies. Political as well as private decision-making often tends to be based on short term considerations, while urban planning should be done with a long term perspective Environmental strategy-based urban planning can provide a long term strategy within which short-run decisions should be taken. For these decisions to be taken, there is a need for information, tools and techniques.

To increase the possibilities of revenue enhancement of the municipalities economic instruments, such as taxes, charges and proper pricing of resources such as water, land and forests, use and development of markets, etc., should be encouraged (these are discussed in Chapter 5). To increase the efficiency of the functions that the LGs need to perform and the treatment of environment as an internality (rather than the normal practice of treating it as an external), there needs to available basic information in the form of databases, environmental status profiles, indicators, etc. Also, the involvement of the local community would help the municipalities to draw planning lessons. They should also be involved in the planning and implementing environmental policies. Local initiatives stimulate greater awareness of local problems and potential.

Thus the possibilities of functional enhancement are plenty provided the management options are used with the necessary capabilities, will and foresight. Some of the options that should be a part of the municipalities are:

- Urban environment database.
- Urban indicators.
- Urban environmental profiles.
- Urban environmental impact assessment/environmental management plans.
- Environmental performance monitoring and environmental audits.

- Economic instruments.
- Public consultation and participation.

Urban environment database

Information is primary for planning. Its form, availability and accessibility as is present today, for the purpose of urban management, is inadequate to say the least. Although there is plenty of data available, they are from a large number of sources and in various formats. As a result, planning even at the local level is hardly ever integrated. A beginning has been made by the National Informatics Centre (NIC) under the Ministry of Electronics, to collate information at the smallest level (village and town as the smallest defined unit) on land use, demography, employment patterns, cattle, water supply/scarcity, education and health facilities and status, etc. This effort needs to be further enhanced to include environmental data and that too at the level of a locality, and the reach/dissemination of this information needs to be wider.

The database should be housed at the office of the LG, at the environmental unit in the case of the larger municipalities, and accessed/fed by all the parastatal organizations. The District and Metropolitan Planning Committees which are to prepare the draft development plans, should centralize and use this database from all the *panchayats* and municipalities that are within their planning jurisdiction. A computerized software should be developed for the purpose, to ensure a standardized format.

Prior to the development of a standardized format, since there will be several users (policy-makers, researchers, NGOs and individuals) and for a variety of purposes, there needs to be a purpose-driven and needs-based analysis conducted by an outside agency. The standardized format should be user-friendly and have the potential for updating. An initial detailed (but far from comprehensive) list of data that should be part of the urban environment database is given in Appendix 1. This data should be time series (for at least the past 10 years). The data should be collected by the Ward Committee representatives of each ward/locality, and fed to the database maintained at the LG office. The data collected by the *nagar panchayat* and the environmental unit must be fed to the District and/or the Metropolitan Planning Committees under which they fall directly.

A plan of action for collection, entry, maintenance and dissemination of the information in the database should be prepared by a professional outside agency in consultation with the LGs Training of the users and feeder of the use of the database (and general computer literacy) should be conducted.

Urban indicators

Urban indicators that cover quality of life (poverty levels, health, etc.), infrastructural or development (sanitation facilities, water supply, housing, etc.) and environmental indicators (air and water pollution, noise, etc.) give very useful snapshots for planning. These indicators[1] give an understanding of the level of development and also environmental degradation in an urban area. It is suggested that general and specific indicators be developed on the economic, environmental and service/infrastructure issues of an area. For the sake of prioritization, and therefore action and investment, these indicators have proved to be very useful in the West. Application of indicators have in the past been more at a macro level, but within the context of decentralized planning efforts in the country, their application and development at the local level needs to be attempted. The LGs should use these indicators to help in making decisions on issues of priority and investments

Generic environmental indicators (normally on a per capita basis) that should be developed should include the following·

- Population without safe drinking water.
- Population without adequate sanitation
- Municipal solid wastes per capita.
- Air pollution per capita (pollutant-wise).
- Housing per capita/housing space per capita
- Open space per capita.
- Per capita energy use (fuel-wise)
- Per capita transport facility (mode-wise)
- Per capita public health care.
- Expenditure on public health.
- and so on..

There should be buoyancy in the indicators. The formulation and understanding of the specific indicators should take into account different urban characteristics. The indicators as the database should be developed by a professional agency in consultation with the public and the LG. There should be an institutional mechanism put in place that updates the indicators through the process of development and investment

Urban environmental profiles

Overall economic and environmental status documents are being prepared by the state and in some cases the districts. This needs to be replicated at the *nagar panchayat* and municipality level. City- and municipality-specific urban environmental profiles need to be developed. These profiles should be comprehensive and updated periodically. Development of the environmental profiles should become a part of the task of the LG, again with consultation of the public and other organizations. The profiles should include trends (at least for the past five years) in:

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[1] An indicator is ...something which provides a clue to a matter of large significance or makes perceptible a trend or phenomenon that is not immediately detectable.

- Geophysical aspects and land use.
- Socio-economic setting.
- Environment-development linkages (water supply, sewerage/sanitation, flood control, solid waste management.
- Status of the urban environment (air and water quality, forest and other lands, archeological/historical sites, etc.).
- Environmental hazards.
- Industrial pollution.
- Transportation.
- Energy and power generation.
- Housing/slums.
- Health care

Simple but standard questionnaires could be used to compile information/data required to develop the profile. The NIC database should be further developed to include the databases, indicators and the urban profiles.

There needs to be definite policy in place for initiating the process of developing the urban databases, indicators and profiles. These activities would need an active move by the municipalities to include them as functions. The central/state governments should work together and immediately assign the task to a private/professional agency, such that a standard format is followed by all the municipalities in the country. The profiles and indicators should be debated in the public (through presentations/public hearings) at the ward level, before taken to be the baseline on which it is further developed.

A system of information dissemination and education of the officials and public should be developed. This should be in the form of public forums, debates, publications, media and seminars for the LGs and others in the use of the indicators for planning.

Environmental impact assessment

In the face of rapid urbanization, the need for environmental impact assessment (EIA) of urban projects is both timely and paramount. This is especially true since the impacts of the project reflect on the immediate population. Social impact of the projects are large and need to be addressed seriously. In order to integrate successful management of the environment EIA should be adopted urban areas as well. EIAs have been mandatory for several activities for over a decade now. With the EPA, 1986, the list of projects for which EIAs became mandatory increased and further increased with the 1994 Gazetted Notification on EIAs. The list is given in Annexure 2. With the development of the database, indicators and the environmental profiles, EIAs will further the process of planning

It is attempted here to provide a general framework for EIA of urban projects, and emphasize the need for a policy on it. Based on priority environmental issues (housing, water & sanitation, land use planning, transportation, and energy) identified earlier, the significant projects that would need EIA are given below.

Presently, apart from highways, projects on airport, coastal tourism, and industry and power, which could come up in any area but also in urban areas, no other urban project requires central statutory environmental clearance or an EIA But all projects that have a capital investment of less than Rs. 50,000 that require clearance under the Air and Water Acts require to be cleared by the state. EIA guidelines exist for most projects that require clearance

Potential impacts of development projects need to be considered in both the local and regional contexts, as well as across a broad spectrum of environmental parameters pertaining to city-wide impacts on air, water, and land quality as well as waste systems and noise pollution. Understanding the entire scope of potential impacts, both adverse and beneficial, is a necessary aspect of the EIA process. Such impacts can be either short term or long term, depending on whether the impact is a direct consequence of the construction of the project or the maintenance and operation of the finished facility. Although a project may have several impacts, only those with the most significant effect should be studied in-depth.

In all urban areas, the following projects should essentially undergo an EIA and environmental management plan (EMP) which is integrated into the total district and the metropolitan plans. Most of the developmental projects in urban areas could broadly be classified under (I) infrastructure and (ii) others (such as office and commercial complexes).

Infrastructure projects

- Roads/highways*.
- Telecommunication facilities*.
- Waste treatment and disposal facilities (ETPs, CETPs, sewage disposal and treatment, landfills, etc.).
- Airports*.
- Rail transport.
- Mass transit facilities.
- Ports/harbours/coastal zone construction.

Others

- Large scale residential, commercial, residential complexes.
- Hospitals.

- Petroleum storage facilities.
- Quarries*.
- Drainage lines.

- These projects statutory require EIAs.

The procedure for undertaking EIAs follows the normal steps given below:

- Project feasibility/screening: This step requires the project proponent to justify the setting up of the project, and conduct an techno-eco-enviro-feasibility. Alternative sites based on both economic and environmental aspects should be identified. Project costs should be worked out keeping alternative sites (and maybe alternative resources) in mind. It is advisable that a preliminary public hearing be held at this stage to evaluate responses to the proposed project.
- Scoping: the sites will be examined to see what the most important impacts could be. Although this may be a qualitative assessment it normally gives a fairly good idea on what the priority issues are. It is suggested that the focus of the EIA be on these and not for the purpose of data collection as it is today.
- Impact identification: There are several techniques to identify impacts, although the most useful (and normally accurate) is the visual/qualitative method. Here public consultation should be undertaken. For the bio-physical environmental impacts, measurements with instruments as prescribed by the ISI system. Matrices are used widely.
- Prediction/evaluation: Again here there are several standard techniques available for prediction and evaluation of bio-physical aspects.
- Environmental impact statement (EIS): The final step of stating the environmental issue of the project is the EIS. It is essentially the problem statement.
- Environmental management plan (EMP). Once the problems have been stated in the EIS, a plan of action to mitigate them needs to be drawn up. This is the EMP. It should provide, technical, managerial and other ways to mitigate all impacts bio-physical and social Also, costs of the impact mitigation should be stated. These need to be added to the total project capital costs, and again the phase of project justification should be conducted. Based on the conditions of the EMP, the clearance is granted or not granted, after review by an Environmental Appraisal Committee in the MoEF. A compulsory public hearing/consultation should be conducted.
- Post project monitoring: This is an important phase in the EIA process that is most neglected. It involves evaluating (I) whether the project proponents have undertaken the EMP options under which condition the clearance was granted in the first place,

and (ii) whether the EMP options had the effect of environmental protection as they were meant to.

- EIA process post-monitoring: There should also be an evaluation of the methodology and evaluation/prediction techniques that were used in the EIA. This should be conducted by another agency

The parameters that would be assessed in most of the cases are similar, but focus should be given more on the socio-cultural aspects

It is necessary that EIA guidelines be developed for the projects identified above. This should be done by an independent professional agency. It is also necessary to amend the EIA Notification further to include these projects. The present guidelines on EIAs give very little to the following aspects (I) post project monitoring of impacts and the EIA process adopted; (ii) social and cultural impacts; and (iii) public consultation and hearings. It is crucial that EMP plan be monitored for both its appropriateness, and for its performance in effectively reducing the impact on the environment. Also, the aspect that is normally forgotten in most project planning processes is that of project justification both from the environmental (or resource point of view (project justification has and is presently purely on economic terms). It is important that new softwares such as impact prediction models and geographic information systems (GIS) be made mandatory in conducting EIAs.

A major point that should be kept in mind is that project level EIAs have a limited value if the regional impacts of the project are not evaluated. The definition of the "region" should be made depending on the project and regional EIAs conducted, that look at the overall impact possibilities in the context of economic growth.

Environmental performance monitoring of municipalities

Performance monitoring is a new concept and follows very well from the development of environmental indicators. The provision of services and infrastructure by the municipalities have been inadequate in quality and quantity. It is necessary that there be a system of assessing why this is the case. To do this a simple but systematic evaluation of the services/infrastructure provided by the municipalities needs to be conducted by an independent agency This evaluation of performance can be gauged (I) by the trends reflected by the indicators developed; (ii) through a survey which will be of public responses through the process of consultation. The NGOs, community and representatives from other municipalities could participate in periodic presentations (and visits of the city/towns) to assess the performance of the municipalities in providing for the community. This is an effective system of feedback which today goes merely as "public grievances" that rarely get heard.

The process of conducting environmental audits for industries to evaluate their environmental performance (mainly again on bio-physical aspects), is essentially the same as that suggested in performance monitoring of municipalities. This also makes them accountable to the public for providing environmentally safe goods by way of services/infrastructure, and therefore the resultant cleaner environment.

Public consultation and participation

The entire purpose of decentralization is to get closer to the wants of the people. Thus, to provide them with what they "want" rather than what is perceived as their "needs", it is crucial that they become part of the planning process. There are several ways by which this could be done effectively, provided care is taken not to politicize this process. The involvement should be at all the levels, i.e., planning and policy, financial, legal, implementation, and operational and maintenance. Some possible ways have been described in the previous chapters. Others would include the following:

- The urban planning authorities should have a short and long term plan for the city, based on the requirements of the residents. With decentralization of the organizational set up of the LG to the level of the wards committees, wards, and the resident associations this is made effectively possible. Ward committees and community associations should forward the requirements of the public and should be represented at the planning/decision-making process even at the final authority level - municipal, state or the central government
- Provision of legal backup to the residents to participate through litigation if necessary. All obligatory functions of urban planning by the local government need legal support through regulations/laws. The 74th Amendment clearly gives Constitutional support to public participation, in addition, there are several legislation already in place that effectively secure the interest of the public (Public Interest Litigation) as well as the environment, such as the Air Act (1981), Water Act (1971), Environment Protection Act (1986), and others Enhancement of these laws to remove any possible loopholes and enactment of new legislation should be a key objective. Here again, a formulation/change in legislation should be voted by the public before being introduced in the statutory system
- Through allowing for participation by investing in providing services and infrastructure Implementation, operation and maintenance are project dependent. Project planners and implementors should plan for long term maintenance. Especially in the case of welfare projects, maintenance should be the primary responsibility of the community, making them accountable for the services that it is to provide.

- By involving the public in deciding project priorities This is done by holding public hearings of all proposed projects. All budgetary decisions which are for services provided must be produced before the public through the media, questionnaires and workshops, for feedback.
- The public can also be involved by certain projects such as SWM, tree planting, etc within their localities.
- The resident associations should hold regular meetings with residents to update them of government plans that is relevant to them

Annexure 1. Urban environment database

	Parameter	*Unit*
Forest area and loss	Forest and woodland area	000 ha
	% of forest and woodland	%
	Closed forest	000 ha
	Open forest	000 ha
	Deforestation of closed forest	000 ha/annum
	Deforestation of open forest	000 ha/annum
	Per capita deforestation	ha/000 persons
Reforestation	Reforestation	000 ha/annum
	Per capita reforestation	ha/000 persons
	Natural reforestation	%
	% successs of reforestation programs	%
Trade in forestry products	Total roundwood production	000 cubic meter
	Fuelwood and charcoal production	000 cubic meter
	Industrial roundwood production	000 cubic meter
	Wood based pannels production	000 cubic meter
	Wood pulp production	000 cubic meter
	Paper and paper board production	000 cubic meter
	Import of forestry products	000 Rs
	Export of forestry products	000 Rs
Land degradation	Total urbanized area	000 ha
	Total built-up area	000 ha
	Degraded land area	000 ha
	Degraded irrigated land	000 ha
Soil erosion	Average annual soil erosion rate	000 tonnes/ha
	Water erosion	000 tonnes/ha
	Wind erosion	000 tonnes/ha
Wetlands	Total wetlands	000 ha
	Estuaries	000 ha
	Mangrove forests	000 ha
	Open coasts	000 ha
	Floodplains	000 ha
	Freshwater marshes	000 ha
	Lakes	000 ha
	Peatlands	000 ha
	Swamp forest	000 ha
	Freshwater wetland	000 ha
	Salt water wetland	000 ha
	Man-made wetland	000 ha

Annexure 1. contd.

	Parameter	*Unit*
Loss of wetlands	Loss of wetlands	000 ha/annum
	Net to agriculture	000 ha
	Net to aquaculture	000 ha
	Net to development (urban & industrial)	000 ha
	Net to fuelwood collection	000 ha
Waterlogging	Waterlogging area	ha
Range lands	Total area	000 ha
	Affected by desertification	000 ha
	Affected by desertification	%
Rainfed croplands	Total area	000 ha
	Affected by desertification	000 ha
	Affected by desertification	%
Irrigated lands	Total area	000 ha
	Affected by desertification	000 ha
	Affected by desertification	%
Forest and woodlands	Total area	000 ha
	Affected by desertification	000 ha
	Affected by desertification	%
Landuse	Crop land	000 ha
	Permanent meadows and pasture	000 ha
	Forest and wood land	000 ha
	Irrigated land	000 ha
	Non-irrigated land	000 ha
	Mining land	000 ha
	Other land	000 ha
	Total land area	000 ha
	Crop land	%
	Permanent meadows and pasture	%
	Forest and wood land	%
	Irrigated land	%
	Non-irrigated land	%
	Mining land	%
	Other land	%

Annexure 1. contd.

	Parameter	*Unit*
Wastes disposal sites	Number of contaminated sites	no
	Area of waste disposal sites	000 ha
	Number of waste disposal sites	no
	Quantum dumped each day	tonnes/day/site
Waste production	Municipal waste	tonnes/month
	Industrial waste	tonnes/month
	Agricultural waste	tonnes/month
	Mining waste	tonnes/month
	Toxic and hazardous waste	tonnes/month
Waste treatment	Municipal waste	%
	Industrial waste	%
	Agricultural waste	%
	Mining waste	%
	Toxic and hazardous waste	%
Waste disposal (by methods)	Incineration on land	tonnes/month
	Incineration at sea	tonnes/month
	Dumping at sea	tonnes/month
	Fuel blending	tonnes/month
	Physical/chemical treatment	tonnes/month
	Solidification/encapsulation	tonnes/month
	Co-disposal facilities	tonnes/month
	Landfills for hazardous wastes	tonnes/month
	Stockpiling of wastes	tonnes/month
	Export of waste	tonnes/month
	Sewer discharges	tonnes/month
	River discharges	tonnes/month
	Costal discharges	tonnes/month
Waste recycled by category	Municipal waste	tonnes/month
	Industrial waste	tonnes/month
	Agricultural waste	tonnes/month
	Mining waste	tonnes/month
	Toxic and hazardous waste	tonnes/month

Annexure 1. contd.

	Parameter	*Unit*
Surface water pollution	Name of most important river/lake	
	Station	
	Test date	
	Temperature	degrees F
	pH	
	BOD	mg/l
	Coliform	100/l
	Suspended solids	mg/l
	TDS	mg/l
	Nitrate + Nitrogen + Nitrite	mg/l of N
	Phosphorus	mg/l of P
	Mercury	mg/l
	Lead	mg/l
	Cadmium	mg/l
	Copper	mg/l
	Zinc	mg/l
	Chromium	mg/l
	Biota	
	Species type	
	Number of species	no
Ground water pollution	Most important aquifers	
	Name of aquifer	
	Test date	
	Nitrate	mg/l
	TDS	mg/l
	pH	
	Chlorides	mg/l
	Sulphates	mg/l
	Sources of pollution (qualitative data)	
Water resources	Total annual internal renewable water resources	cubic KL/y
	Per capita internal renewable water resources	000 m3/y
	Per capita river flow (by river basin)	000 m3/y
	Name of river basin	
Consumption of water	Total annual withdrawls	cubic KL/y
	Total annual withdrawal as % of total water resources	%
	Per capita withdrawal from water resources	000 m3/y
	Sectoral withdrawls as % of total water resources	%
	- Domestic	
	- Industry	
	- Agriculture	

Annexure 1. contd.

	Parameter	*Unit*
Marine water pollution	Average annual oil spill	000 tonnes/y
	Average annual sediment load	tonnes/y
	Average annual untreated industrial waste	tonnes/y
	Average annual untreated domestic waste	tonnes/y
	Average annual agricultural wastes	tonnes/y
	% of urban population in large coastal cities	%
	Hg	mg/l
	Pb	mg/l
	Cd	mg/l
	Cu	mg/l
	Fe	mg/l
	Mn	mg/l
	Zn	mg/l
	Ni	mg/l
	Co	mg/l
	PCBs	mg/l
	Average mean monthly sea temperature	degrees C
Sources of marine pollution (as a % of total)	Domestic waste	%
	Industrial effluents	%
	Run-off (urban)	%
	Coastal population	%
	Coastal industries	%
	Transport/oil tanker	%
	Oil refinery wastes	%
	Oil exploration sites	%
Air pollution emission	Name of city	
	CO (Carbon monoxide)	tonnes/y
	CO2 (Carbon dioxide)	tonnes/y
	SO2 (Sulphur dioxide)	tonnes/y
	NOx (Nitrogen oxide)	tonnes/y
	Pb (Lead)	tonnes/y
	CFC (Chlorofluro-carbon)	tonnes/y
	Halon	tonnes/y
	CH4 (Methane)	tonnes/y
Ambient pollutant concentration	Name of city	
	CO (Carbon monoxide)	mg/m3
	CO2 (Carbon dioxide)	mg/m3
	SO2 (Sulphur dioxide)	mg/m3
	NOx (Nitrogen oxide)	mg/m3
	Pb (Lead)	mg/m3
	CFC (Chlorofluro-carbon)	mg/m3
	Halon	mg/m3
	CH4 (Methane)	mg/m3
	Suspended particulate matter	mg/m3
	Acidity (rainwater pH)	
	Percentage of population using air conditioners	%
	Total number of motor vehicles	000

Annexure 1. contd.

	Parameter	***Unit***	
Source-wise emission	tonnes/y	SPM	CO
	-Transport		
	- Industry		
	-Agriculture		
	-Live stock		
	-Oil and gas production		
	Emission of Pb from		
Atmosphere & Climate change	Rainfall	mm	
	Total annual rainfall	mm	
	Mean monthly temperature	degrees C	
	Average monthly wind speed	km/h	
	Average daily sunshine hours	hr	
	Mean monthly evapotranspiration	mm	
	Relative humidity	%	
Biodiversity	Flora		
	- Number of species of fungi	no	
	- Number of each extinct	no	
	- Number of species of algae	no	
	- Number of each extinct	no	
	- Number of high (vascular) plants	no	
	- Number of each extinct	no	
	- Number of other lower plants (lichens/mosses)	no.	
	- Number of each extinct	no.	
	Fauna		
	- Number of mammals	no	
	- Number of each extinct	no	
	- Number of birds	no.	
	- Number of each extinct	no	
	- Number of amphibians	no	
	- Number of each extinct	no	
	- Number of reptiles	no	
	- Number of each extinct	no	
	- Number of butterflies	no.	
	- Number of each extinct	no.	
	- Number of fish	no.	
	- Number of each extinct		
Loss of fish	Inland fish production	000 tonnes/y	
	Marine fish production	000 tonnes/y	
	Total fish export	000 tonnes/y	
	Total fish import	000 tonnes/y	

Annexure 1. contd.

	Parameter	*Unit*		
National parks & protected areas	Scientific reserves and strict nature reserves	000 ha		
	National parks	000 ha		
	Natural monuments and natural land marks	000 ha		
	Managed nature reserves and wildlife sanctuaries	000 ha		
	Total nationally protected areas	000 ha		
	Total no. of nationally protected areas	no		
	Protected areas as % of total land areas	%		
International parks & protected areas	Biosphere reserves	000 ha		
	Wet land of international importance	000 ha		
	Marine and coastal protected areas	000 ha		
	World heritage sites	000 ha		
Community protected areas	Water-source protected areas	000 ha		
	Religious protected areas	000 ha		
	Sacred forest areas	000 ha		
Population	Total population	million		
	Total fertility rate	per women		
	Age distribution			
	- 0-5 years	%		
	- 6-12 years	%		
	- 13-18 years	%		
	- 19- 35 years	%		
	- 35-60 years	%		
	- above 60 years	%		
	Sex ratio	male/female		
Population growth	Crude birth rate	no per 1000 persons		
	Crude death rate	no per 1000 persons		
	Population density	p/km2		
	Annual average population growth rate	%		
Rural-urban migration	Rural population	million		
	Urban population	million		
	Population density -rural	p/km2		
	Population density -urban	p/km2		
Education	000 numbers	Institutions	Teaching staff	Students
	Primary			
	Secondary			
	Higher secondary			
	Colleges			
	Universities			
	Teaching staff			
Literacy rate	Adult literacy rate -male	%		
	Adult literacy rate -female	%		
	Population without any schooling -rural	%		
	Population without any schooling -urban	%		

Annexure 1. contd.

	Parameter	*Unit*
Poverty	Total population below poverty line	millions
	Total urban population below poverty line	millions
	Total rural population below poverty line	millions
	Numbers of absolute poor in rural areas	millions
	Total rural women living below poverty line	millions
	Access to safe drinking water	%
	Access to safe drinking water	%
	Access to sanitation services	%
Health	Nos of physicians	no
	Nos. of dentists	no
	Nos of traditional medical practitioner	no
	Nos. of pharmacists	no
	Nos. of nurses	no
	Nos of population per physician	no.
	Nos of hospitals	no.
	Nos. of population per bed	no.
	Total calories consumption	per capita/day
	Total protein consumption	per capita/day
	Total fat consumption	per capita/day
	Total vegetable calories consumption	per capita/day
	Total vegetable protein consumption	per capita/day
	Total vegetable fat consumption	per capita/day
	Total animals calories consumption	per capita/day
	Total animal protein consumption	per capita/day
	Total animal fat consumption	per capita/day
	Available calories as % of requirement	per capita/day
	Average life expectancy of male	years
	Average life expectancy of female	years
	Infant mortality rate	per 1000 births
	Malnutrition in children under five years	000
	No of human population exposed to radiation	000
Mortality incidence	Nos of deaths due to Cholera	000
	Nos. of deaths due to Malaria	000
	Nos of deaths due to Tuberculosis (T B)	000
	Nos. of deaths due to Malignant Neoplasm	000
	Nos of deaths due to Diabetes	000
	Nos. of deaths due to Anaemic	000
	Nos of deaths due to Chronic Heart Diseases	000
	Nos. of deaths due to Pneumonia	000
	Nos of deaths due to Influenza	000
	Nos of deaths due to Bronchitis and Asthma	000
	Nos of deaths due to Pneumonic Plauge	000
	Nos of deaths due to Chronic Lever Diseases	000
	Nos of HIV cases (AIDS) identified	000
	Nos. of deaths due to AIDS	000
	Nos of deaths due to motor vehicle accidents	000
	Nos of deaths due to suicide	000

Annexure 1. contd.

	Parameter	*Unit*
Noise pollution	Name of the city	
	Percent of human population afflicted by noise	%
	Percent of human population in noise prone areas	%
	Level of noise in most urbanized cities	dB(A)
Health education	Nos. of Governmental / non-governmental organizations	no
	involved in health education programs	000
	% of rural population getting health education	%
	Total annual expenditures on health education	000 Rs
Tourism - International / Internal	Nos. of domestic tourists	000
	Nos of international tourists	000
	Receipt from domestic tourists	million Rs
	Receipt from international tourists	million Rs
	Nos. of hotel rooms	000
	Nos of beds available	000
	Occupancy rates	%
	Nos of tourist resorts in eco-sensitive areas	no.
Transportation	Length of roads	000 km
	Length of railway	000 km
	Total number of airports	000
	Nos of cars	000
	Nos of commercial vehicles	000
	Nos of railway wagons	000
	Nos of motor boat	000
	Nos. of diesel locomotives	000
	Nos. of electric locomotives	000
	Other locomotives	000
	Railway traffic	million tonne-km
	Railway traffic	million tonne-km

Annexure 1. contd.

	Parameter	*Unit*
Energy	Thermal & hydropower production	million kWh
	Thermal & hydropower use	million kWh
	Thermal & hydropower export	million kWh
	Thermal & hydropower import	million kWh
	Coal production	000 mt
	Coal use	000 mt
	Coal export	000 mt
	Coal import	000 mt
	Natural gas production	million m3
	Natural gas use	million m3
	Natural gas export	million m3
	Natural gas import	000 mt
	Crude petroleum production	000 mt
	Crude petroleum use	000 mt
	Crude petroleum export	000 mt
	Crude petroleum import	000 mt
	Power generation from nuclear power plants	million kWh
	Per capita commercial energy consumption	kgoe
	Solar energy production	000 kWh
	Wind energy production	000 kWh
	Biomass energy production	000 kWh
Industry		
Mining & quarrying	Iron-bearing ores	000 mt
	Copper-bearing ores	000 mt
	Lead-bearing ores	000 mt
	Zinc-bearing ores	000 mt
	Nickel-bearing ores	000 mt
	Manganese-bearing ores	000 mt
	Bauxite	000 mt
	Chromium-bearing ores	000 mt
	Tungsten-bearing ores	000 mt
	Silver bearing ores	000 mt
	Gold-bearing ores	000 mt
	Salt (sea)	000 mt

Annexure 1. contd.

	Parameter	***Unit***
Manufacturing	Refrigerators	000 mt
	Cement	000 mt
	Glass	000 mt
	Sugar	000 mt
	Cigarettes	000 mt
	Crude steel	000 mt
	Rubber	000 mt
	Tires for road vehicles	000
	Caustic soda	000 mt
	Sulphuric acid	000 mt
	Hydrochloric acid	000 mt
	Residual fuel oils	000 mt
	Kerosine	000 mt
	Naphthas	000 mt
Economy and employment	GDP	million Rs
	GNP per capita	Rs.
	GDP savings per capita	Rs.
	Inflation - CPI (%)	%
	Total foreign debt	million Rs
	Total employed persons	000
	Total unemployed persons	000
	Unemployment rate	%
Air quality stations	Nos of air quality monitoring stations in the country	no
	Nos of air quality monitoring stations in each city	no.
	City:	
	Nos. of station	no.
	Legislation available for air quality control (Yes/No)	
	Adequacy of existing legialation (Adequate/Inadequate)	
	Amount of budgetary allocation	million Rs

exure 2. List of projects that require environmental clearance

Nuclear power and related projects such as heavy water plants, nuclear fuel complex, rare earths.
River valley projects including hydel power, major irrigation and their combination including flood control.
Ports, harbours, airports (except minor ports and harbours).
Petroleum refineries including crude and product pipelines.
Chemical fertilisers (nitrogenous and phosphatic other than single superphosphate).
Pesticides (technical).
Petrochemical complexes (both olefinic and aromatic) and petro-chemical intermediates such as DMT, Caprolactam, LAB, etc. and production of basic plastics such as LDPE, HDPE, PP, PVS.
Bulk drugs and pharmaceuticals
Exploration for oil and gas and their production; transportation and storage.
Synthetic rubber
Asbestos and asbestos products.
Hydrocyanic acid and its derivatives
Primary metallurgical industries (such as production of iron and steel, aluminium, copper, zinc, lead and ferro alloys)
Electric arc furnaces (mini steel plants)
Chlor-alkali industry.
Integrated paint complex including manufacture of resins and basic raw materials required in the manufacture of paints
Viscose staple fibre and filament yarn.
Storage batteries integrated with manufacture of oxides of lead and lead antimony alloy.
All tourism products between 200 to 500 meters of high tide line or at locations with an elevation of more than 100 meters with investment of more than Rs.5 crores.
Thermal power plants.
Mining projects (major minerals) with leases more than 5 hectares.
Highway projects.
Tarred roads in himalayas and/or forest areas.
Distilleries.
Raw skins and hides.
Pulp, paper and newsprint.
Dyes.
Cement.
Foundries (individual).
Electroplating.